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LANDSCAPE ARCHITECTURE*

Origin of Term, Landscape Architecture—First Used in This Country by Frederick Law Olmsted, Sr.—Notable Instances of Its Application

By Stephen Child, Mem. Am. Soc'y C. E.

WHAT is Landscape Architecture, and what does a Landscape Architect do? These are questions so frequently asked nowadays that it seems advisable to consider them briefly with a view to a clearer understanding of their meaning. There is, at the present time, even among intelligent writers, the greatest possible confusion and apparent misunderstanding of the terms landscape architect and landscape gardener—even such finished writers as Mrs. Schuyler Van Rensselaer and Charles Mulford Robinson using the terms somewhat loosely. Recent discussion of the terms brought out the opinion that this calling a man a landscape architect instead of a landscape gardener is merely a "recent fad," and that the idea is absurd, "filling one's mind with images of quarries, stonecutters, creaking derricks, tapping trowels and the like, instead of with pictures of freehand dealing with sunshine and shadow, trees, flowering shrubs and leaping fountains."

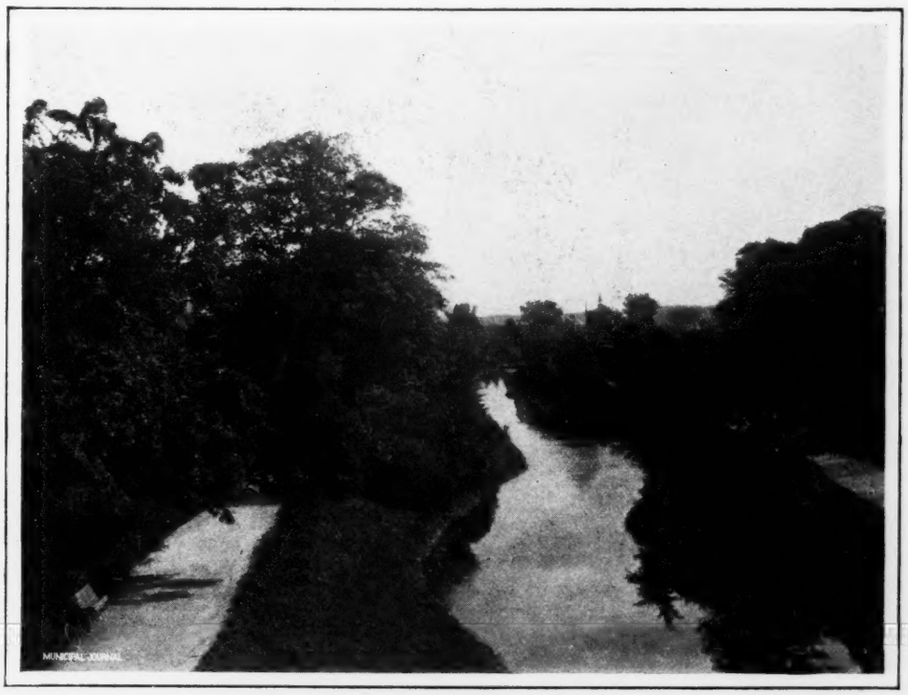

FIG. 4—RIVERWAY, BOSTON PARK SYSTEM—SOUTH FROM LONGWOOD AVE BRIDGE

Let us look at this a little more carefully and see what is true in all this discussion. In the first place, the term is not a "recent fad." Mr. Frederick Law Olmsted, Sr., called himself a landscape architect away back in 1856, when he first entered upon the work of developing Central Park in New York City, and the fact that he did so, and continued to so designate himself during the whole of his career has had much to do with the general adoption of the term. But because one man, even an eminent one, adopted this title is perhaps not entirely sufficient, although those of us who are familiar with Mr. Olmsted's work and with his wonderful genius and mastery of the subject in all of its details may well feel assured that he did not do so without most careful thought. Unfortunately, he did not in his writings, as far as I am aware, really explain his reason. He was so immersed in the great battle then going on for public parks for large cities, in their value and necessity, and in laying down the principles and executing the work of these great undertakings that he apparently had little time to explain fully why he assumed the title. We may, however, be perfectly assured that he had reasons, and most excellent ones, and a little study of these may be interesting and profitable.

In the process of the development of mankind there has been noticeable a constantly increasing tendency toward differentiation and specialization, each step in the process being a slow one, and, as a rule, taken at first by some man or group of men trained in some

* The Editor has been fortunate in securing three articles upon the subject of Landscape Architecture, development of public parks, etc., by Mr. Stephen Child, the well-known landscape architect, of Boston, who belongs to the modern school of that profession, as developed by the late Frederick Law Olmsted, Sr. This is the first of the series; the second will appear in a near number of the MUNICIPAL JOURNAL AND ENGINEER.—[EDITOR.

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other line. There have come about in this way many new forms or fields of work, each adopted more or less from others of a previous and perhaps lesser civilization. Each new profession, or branch from an older one demanded and received a new cognomen. This process of differentiation has developed more or less clearly defined groups of men; as, for example, the profession of the ministry, medicine, law, civil engineering, architecture, and so on.

Fifty, years ago, when Mr. Olmsted began this work of landscape design, there was beginning to be a demand in this country for men to do a certain line of work that was intrinsically quite different from that previously carried on by either the architect, the engineer, or the gardener, and yet work that embodied some of the principles heretofore utilized by all of these men. Here was this great tract of land, which we now know as Central Park, to be developed and made beautiful for the purpose of providing the crowded millions of the great city of the future with the opportunity "for a form of recreation to be obtained only through the influence of pleasing natural scenery upon the sensibilities of those quietly contemplating it." This was a new problem for this country, and indeed for any other, for none of the great parks in Europe, now utilized for this purpose, were originally created for anything of this sort. They are chiefly the result of developing land that had originally been set aside as hunting forests by the great nobles or rulers of Europe.

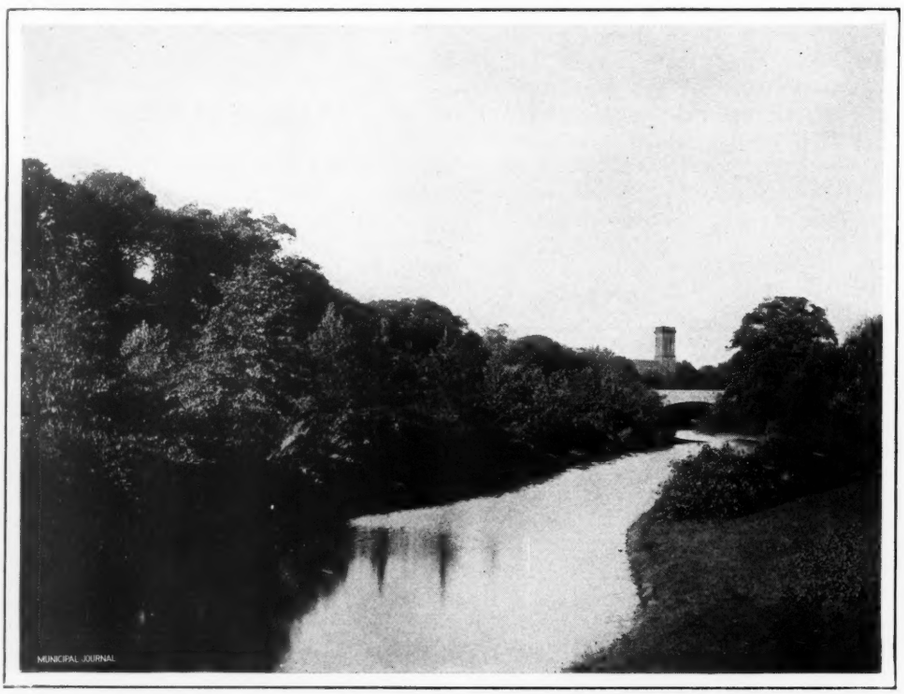


FIG. 5—THE RIVERWAY—LONGWOOD AVE. BRIDGE IN DISTANCE

New York was most fortunate in its selection of the master mind to work out this problem, and most successfully has it been done. Mr. Olmsted saw clearly the greatness of the task and the differentiation of this form of design from that of the architect or engineer, and certainly from the work of the gardener. He chose to call himself a landscape architect. Let us therefore look into the meaning of these words, and see if they are not well selected and worthy of our respect and of more general adoption.

That most delightful and interesting writer, Philip Gilbert Hamerton, says of landscape: "We use the word in two distinct senses: a general and a particular. In the general sense, the word 'landscape' without the article means the visible material world, all that can be seen on the surface of the earth by a man who is himself upon the surface; and, in the special sense, 'a landscape' means a piece of the earth's surface that can be seen at once, and it is always understood that this piece will have a certain artistic unity or suggestion of unity in itself," and further, "although the word refers to the natural land, it does not exclude any human works that are upon the land." The word is derived from two good Anglo-Saxon parts, "land" and the suffix "scape," corresponding to "skip" or "ship," as in "friendship," meaning "the state or condition of being." Landscape then, means "the state or condition of being land." When we come to add the word architecture to this word landscape, however, the connotation conveys to many people a wrong impression, but it should not, for in its early and primitive meaning the word architect meant simply and solely "chief-workman," or "master-artisan."

It is quite largely the architect himself who is responsible for this wrong impression, as many of them have assumed that because the word architect is used at all the term landscape architect means simply an architect who meddles a bit with the landscape immediately surrounding his buildings. Many architects have done this with regrettable results both to the client and the profession of landscape architecture. What Mr. Olmsted meant when he termed himself a landscape architect was that he was aiming to be a "master-artisan in matters pertaining to land," a "designer of landscapes," one whose work in a very real sense covered agriculture, forestry, gardening, engineering and the elements of architecture, and who shall say that his work does not show a complete mastery of all of these.

Landscape architecture has been defined as "a group of activities which include horticulture, architecture, civil engineering and agriculture." Humphrey Repton, a great English authority on matters of this sort, says that in order to carry out this line of work, one must possess not only artistic ability and taste, but "a complete knowledge of surveying, mechanics, hydraulics, botany, and the general principles of architecture." We may well weigh his words, for Humphrey Repton was a cultivated English gentleman of great refinement and good taste. He was the first man from such a grade of society to undertake the planning or designing of country estates. Kent, one of his predecessors, was a coach painter by trade, who possessed some artistic taste, but little culture. "Capability" Brown, Repton's most famous immediate predecessor, was a gardener, who, by association with men of refinement and by his tact and native ability, worked his way up to an honorable place; but Repton was a well educated English gentleman, who had traveled and studied much. Repton, however, called himself a landscape gardener, as did all of the others at that time; but Mr. Olmsted chose to avoid that term for several reasons. In the first place, these workers in landscape design in England had confined their efforts entirely to the design of country estates. The term landscape gardener was, I believe, first used by Shenstone to mean more particularly an informal or picturesque treatment of the grounds of an estate as distinguished from the older style of formal treatment that had been in vogue and which had been carried to such excess.

In the early part of the Eighteenth Century formality had been carried to the point of puerility. A reaction set in, due to numerous causes, and the "New Style," or so-called "English Style," was introduced by Kent and others, who, as Walpole enthusiastically exclaimed, "leaped the wall and saw all nature was a garden," and so in fact it is in those delightful parts of old England in which they labored; those country estates with their deer parks and pleasure grounds. These men made a practice of designing country places in an informal or naturalistic manner, and termed this landscape gardening. They were in favor of abolishing *all* formality, and they themselves carried *their* theory to excess.

Later, in the latter part of the eighteenth and the first half of the nineteenth centuries, men like Repton came forward realizing that formality had its place and excellence, and began to use it under

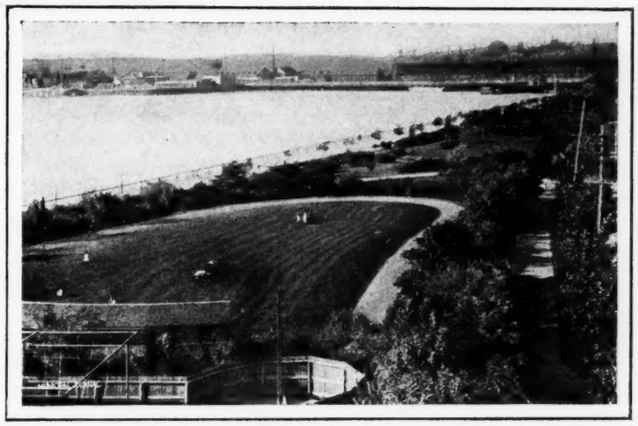


FIG. 6—CHARLESBANK PLAYGROUND, BOSTON

certain circumstances, but still called themselves landscape gardeners. This latter use of the term was a serious twisting of the original meaning, for a garden is, properly speaking, a place engirt, enclosed or set apart and highly cultivated. Landscape is, as we have seen, a piece of the earth's surface that can be seen at one time by a man who is himself standing upon the earth, and may of course mean a broad stretch of country not at all enclosed. There is another important point and one that has not been particularly mentioned in the discussion of landscape architecture, namely, that these English landscape designers, as I have already mentioned, were engaged almost exclusively in the preparation of plans for country estates. These were of course not always large and often were walled-in or engirt, and therefore perhaps in a sense gardens. Mr. Olmsted, in 1856, had before him not such a problem, but that of designing a great public park for a large city. This work was not gardening in any sense of the word, it was something quite different. It was a work of design, a work that could only be undertaken and successfully carried out by a "master-artisan in matters pertaining to land." Here was to be developed—and we now know how well it has been done—broad, peaceful landscape effects, giving the tired city dweller opportunity for restful contemplation and relief from city sights and sounds. These were to be designed and executed where none had existed before and in such a way that there should be no obtrusive evidence of man's elaborate control and no marring of the pleasing restful effect by such garden elements as beds of geraniums, or rare and striking shrubs clipped into formal shapes—in other words, no gardening. This was what he termed landscape architecture. The French landscape designers had already adopted this term, as their phrase, architecte paysagiste, means simply landscape architect.

Many of Mr. Olmsted's great works are familiar to us all. They include Central Park, New York; Prospect Park, Brooklyn; the almost unrivalled park system of Boston; the great work designed by him at the World's Fair in Chicago, and almost innumerable country estates, notably Biltmore, at Asheville, N. C., the mere enumeration of which serves to show some of the diversity of the work, and even the most casual observer can see in them some of the reasons why this sort of work is not properly to be called landscape gardening. A gardener, as commonly understood, is one who cultivates a garden. He may, and, of course, should, know a great deal about botany and horticulture, but when you come to associate the word garden with landscape there is implied simply that we have a gardener who cares for a garden having a naturalistic or landscape character, the absolutely essential factor of creative design disappears. Expensive mistakes have often resulted from employing a person on landscape work who was simply a common gardener and ignorant of the principles of this sort of design. Art commissioners would not think of employing a man to design a monumental public library or city hall simply because he was a good stone mason.

Landscape architecture is, then, as Mr. Charles Eliot, one of Mr. Olmsted's gifted disciples, has well said, "the art of arranging land for use, and the accompanying landscape for enjoyment." Landscape gardening is really a term conveying in itself confused ideas,

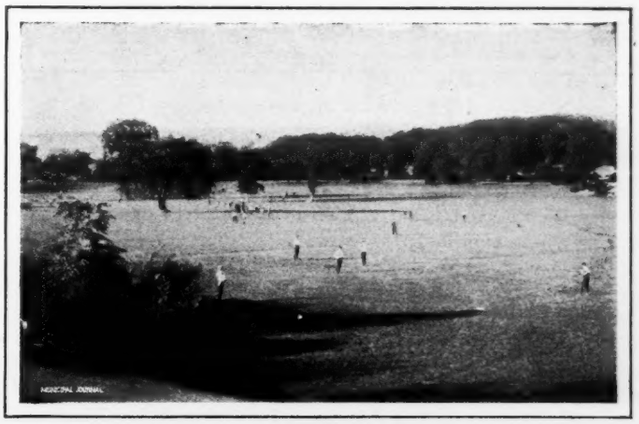


FIG. I—VIEW IN FRANKLIN PARK, BOSTON

but used, if at all properly, simply to cover that part of the landscape architect's work which has to do with the development of formal or natural beauty by the simple process of removing or setting out and caring for plants. This is quite secondary to the matter of designing a general scheme for the development of land for any given purpose.

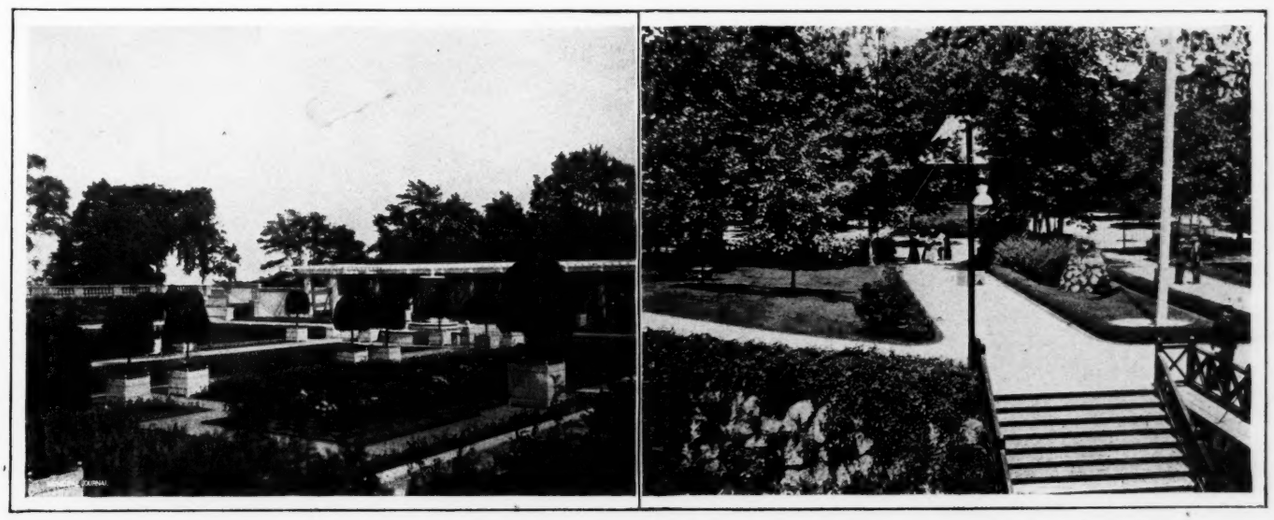


FIG. 8—AN AMERICAN "ITALIAN GARDEN"—FIG. 9—BANDSTAND, PLAZA STREET RAILWAY CO.'S AMUSEMENT PARK, WHERE 30,000 ARE OFTEN ACCOMMODATED

FIG. 7—COUNTRY SEAT NEAR BOSTON

The problems that a landscape architect has to deal with are many and varied, among them are, as we have seen, the design for a great country park for a large city, where the object is, or should be, to afford perfect relief and rest to the tired citizen by offering to him and preserving for him, the contrast of broad restful rural scenery unmarred by any of the sights and sounds of city life (Fig. 1). This is a great problem involving many considerations as to choice of the tract of land, its bounds, its present scenic effects, its accessibility, the design of roads and paths through it, so that the public may enjoy, but not destroy, its beauties. Often approaches to the park, "Parkways" so called, are to be designed involving much careful thought as to details of grades (Figs. 2 and 3). Perhaps a hitherto neglected sluggish stream whose banks had been an unsightly dumping ground can be transformed, as in Figs. 4 and 5, by careful design into a beautiful parkway. These last two illustrations are scenes on what is known as the "Riverway," a part of Boston's Parkway System, leading from the city proper to Franklin Park, and are especially good examples of landscape design, for beautiful and natural as they now appear, there is hardly a line or bit of vegetation, except the older trees, that has not been placed where we now see it by the hand of man.

Fifteen years ago this part of the town was one of the ugliest sites imaginable. A brackish stream struggled along through tangled masses of sedges and swamp land. Now all is beauty of the most restful sort, but every particle of it is the result of design. This is not landscape gardening, but landscape architecture, the work of a "master-artisan in matters pertaining to land."

Other problems for the landscape architect are the planning of the more or less formal paths and plantings of the city square, the development in a pleasing way of the children's playground (Fig. 6), or the surroundings of the school house with its school garden, now such a necessary adjunct to American educational methods. The stately public library or city hall must have its appropriate landscape setting. The landscape architect should share with the architect in the designing of country estates and homes (Fig. 7), working together to place the house and the buildings properly as regards terraces, approach roads and paths, and using his trained taste and experience in working out appropriate changes in the surrounding scenery, perhaps screening by judiciously placed planting an unsightly neighboring building. There may be a formal garden to design (Fig. 8), with its paths, ramps, terraces and pergolas. Perhaps a street railway company desires an amusement park for its thousands of patrons (Fig. 9). In this case provision must be made for the necessary bandstand, open-air theatre and other amusement features, and great care exercised in securing ample approaches and the like.

There is much for the landscape architect to do in the laying out of new suburbs for our growing cities, residential parks, neighborhoods of summer cottages at the mountains or seashore, there are the grounds of hospitals, education and other institutions; of hotels and railroad stations to be designed. All of these are problems involving the thoughtful care of trained minds. In all of them the first and fundamental purpose should be to ascertain by careful study of the existing natural conditions what the "genius of the place" really is, what it is that nature herself hints at, and then by taste and judgment to so design the improvements that they will harmonize with the natural tendencies of the place, always remembering what Charles Eliot has so wisely said, that "what would be fair must first be fit."

FIG. 2 PART OF BOSTON'S PARKWAY SYSTEM FIG. 3

BUILDING ROADS WITH CONVICT LABOR

An Interesting Account of Employing County Prisoners on Highway Construction in Schenectady County, New York—Excellent Results Elsewhere in the Empire State

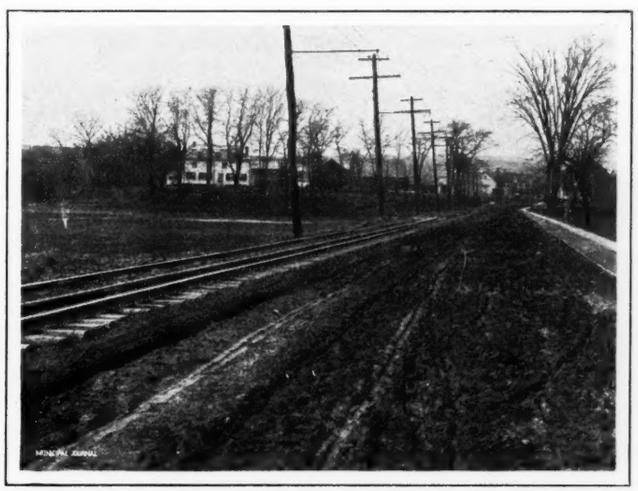
By Will Templar

Man has always been going somewhere, or returning from some place. In his going and coming he has never been known to choose any but the smoothest paths and those having the fewest obstructions. In this particular he is but following animal instinct, for do not the beasts of the field and forest follow the same rule? So far, all creatures that walk the earth are champions of good roads, but the desire for *better* roads is confined to men (and horses) alone, and is in a direct line with man's aspirations to better the conditions of life, morally, socially and financially, and to bequeath to posterity a distinguished mark of his fidelity to home and country.

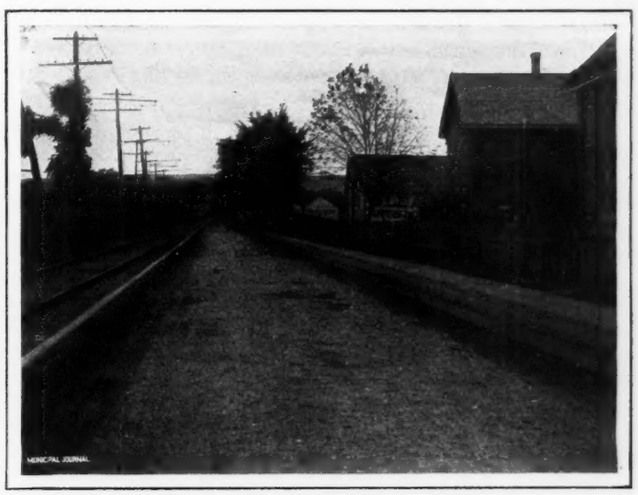
From the foot worn path of the savage through the jungle to the magnificent speedway of New York is a long hark, yet the latter was evolved from the former as surely as was the two-minute trotter evolved from the ancient wild pony of central Asia.

This Is the Dawn of the Good Roads Era

It is not the purpose of this article to trace the history of road building, or to offer arguments in favor of the betterment of our highways; that battle has been fought. The rural dweller no longer looks with favor on the "hard-cider-story-and-slush" so-called high-



SCOTIA DIKE BEFORE IMPROVEMENT



THE DIKE AFTER IMPROVEMENT

way of his fathers, and little by little his purse strings have loosened in response to his own common sense and certainty of benefits and to the clamor of urbanites for roads in keeping with the demands of the times along the lines of commerce, rapidity of transit, comfort and pleasure.

The era of "good roads" is upon us, and the question of the hour is how to build them excellently and at the same time economically.

Men have ever been striving to discover the secret of getting something for nothing, and in the matter of country roads they have came as near success in that direction as in any scheme ever tried. They have expended next to nothing on the highways, and as a reward have gained something in the way of an abomination wholly commensurate with their paying price. Now that they have arrived at the point where they are willing to pay something to obtain something, the cry is going up:

"What is the best and cheapest plan for getting something for which we are willing to pay something?"

The enactment of generous State aid laws and the gradual adoption of modern systems of highway improvement have gone far toward solving the problem, but as we are all interested in paying for these improved highways, we are naturally anxious that the improvement come quickly and that it pass our door. It is a wise and noble sentiment that impels us to build monuments of use and beauty for the benefit of those who are to come after us, but as posterity is sure to enjoy the results of our efforts in its turn, we cannot be accused of selfishness if we cast about for every available means of pushing our needs and desires to fruition, that a season of their enjoyment may fall to our share.

State Law Requiring Employment for Prisoners Disregarded in Most Countries

Sometimes when searching for a means to an end, we find an end to a means. For many years the problem of how best to furnish employment to the unfortunates confined in our jails and prisons has been a serious one. That prisoners should not be kept in idleness is so obvious to the dullest intellect that a recital of the reasons "why" would be a mere waste of time. But the "how" again confronts us. Right or wrong, organized labor has raised an outcry against prison made goods coming into competition with the product of honest labor, and trades unionists have not been alone in the boycott of prison made articles. These forces have gained the legislative ear, and the consequent laws have become the despair of penologists.

The county law of the State of New York requires that jail inmates be kept employed, yet almost every county in the State is acting in direct violation of that law by supporting its prisoners in idleness in county jails, or by paying their board at penitentiaries.

The blame should not be altogether imputed to the county authorities. How to furnish employment to prisoners and still not be bringing the fruit of such labor into competition with that of free workingmen has long puzzled the brains of men who have made a life long study of prisons and prison labor. Where the county authorities have been derelict in duty is the fact that although the laws of the State have long ago given boards of supervisors power to establish plants for the employment of convicts, and although the suggestion that the use of such labor at highway improvement would not seriously conflict with the rights of free workingmen, they have been slow in making the experiment, or, as is the case in most counties, they have not made it at all.

The Pros and Cons of Using Prison Labor to Build Roads

From its inception, the plan has had its advocates and its enemies.

The latter base their objections mostly on the grounds of sentiment and philanthropy. The former urge philanthropy of another sort, economy, utility and hard-headed common sense. Following are some of the objections with their answers:

Q. "Would the employment of convicts on the roads seriously conflict with outside labor?"

A. "By doing work that never has been done before, a new field of labor would be created. Besides, the kind of labor required would be of a sort sought only by alien laborers of the lowest grade."

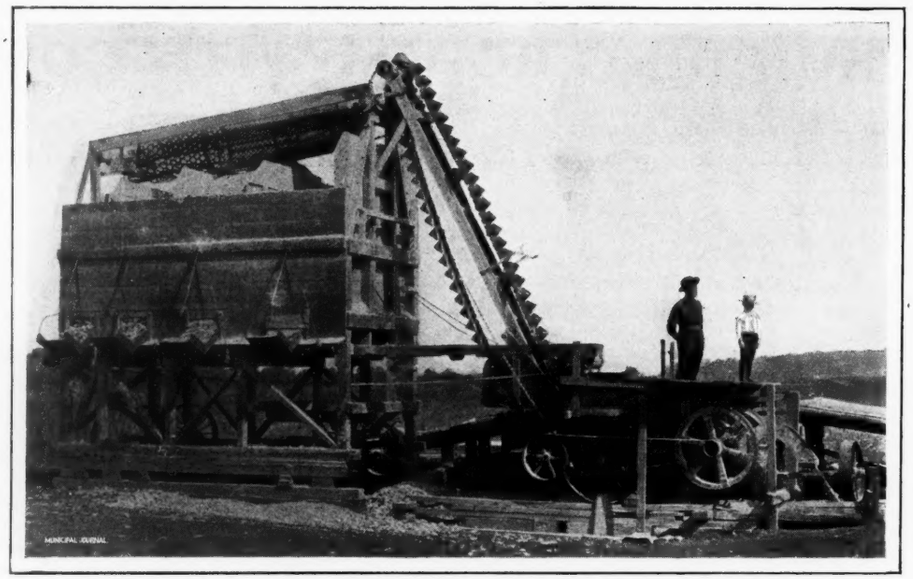
Q. "Would it be necessary to employ large numbers of keepers to guard the prisoners, and would many of them be shot while endeavoring to escape?"

A. "It is not proposed to work desperate, long term prisoners on the roads. The incentive to remain will be made greater than the desire to escape with the chances of re-capture and a still longer sentence to serve. The proportion of guards to the number of prisoners need not be large, and actual deaths by shooting, are, as yet, unheard of."

Q. "Will necessary exposing men under sentence to the gaze of the public harden and demoralize them?"

A. "Then let them do nothing that need make such exposure necessary. Many a man does not deem a term in jail as a special humiliation or disgrace so long as the prison walls shelter him from the eyes of the public, but let him be seen daily working with a convict gang and he will take care not to put himself into a similar position again."

These are a few of the objections raised by well-meaning humanitarians and reformers, but from the foreging it would seem that the advocates of the movement have the best of the argument from a practical and business point of view. Several counties in the State, notably Oneida and Schenectady, have adopted the system, and the experiment in these counties is being watched with peculiar interest.



ACME STONE CRUSHER AND PORTABLE BIN USED IN THE WORK

The Experiment in Schenectady County

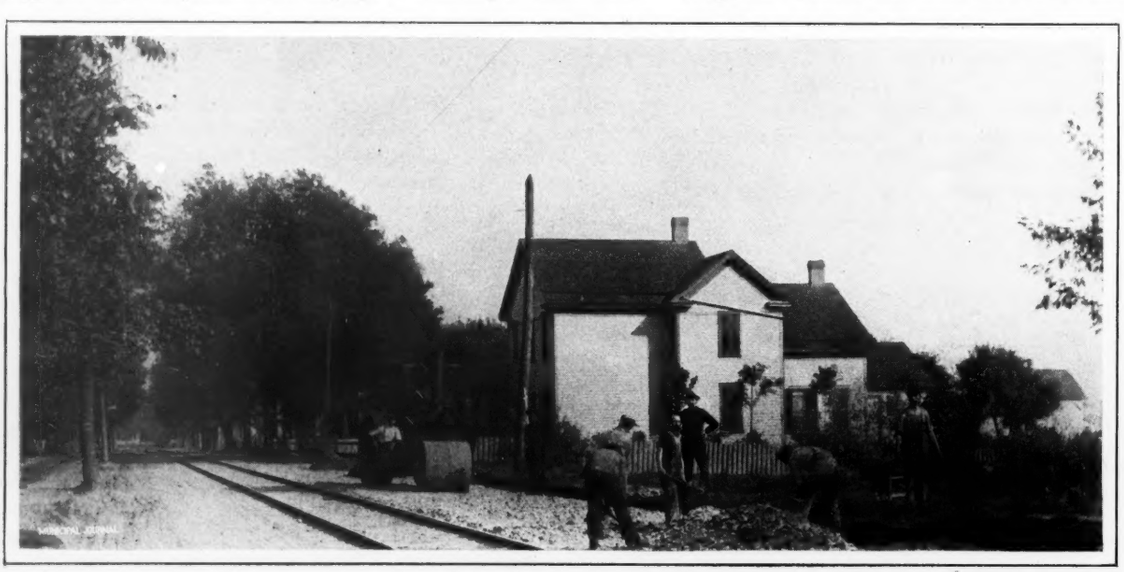
In December, 1902, when the secretary of the State Prison Commission made his report of a recent jail inspection to the board of supervisors of Schenectady County, the principal criticism embodied in the same was due to the fact that no employment was furnished to the men confined. The secretary called attention to the wretched condition of the highways adjacent to the city of Schenectady and suggested that the prisoners be employed in the improvement of the same. In his suggestion the secretary named at least three benefits sure to accrue:

1. To the prisoners themselves, by cultivating habits of industry and fitting them for labor when discharged.
2. Creating a disinclination on the part of many of them to serving terms in jail with a surety of hard labor attached to the sentence.
3. The certain improvement to the highways within a radius of several miles of the jail.

The board of supervisors at once fell in with the spirit of the report and passed a resolution directing the standing committee on roads and bridges to investigate the plan as worked in other States and counties. An exhaustive report was the result of the committee's investigation, followed by a recommendation that the plan be adopted. This was ratified without delay, and the road committee instructed to purchase machinery and tools necessary to put the plan in execution.

The First Contract to Build Roads

On April 1, 1903, the committee entered into contract with the authorities of the town of Glenville to macadamize a half-mile stretch of notoriously bad road known as the "Scotia Dike." By the terms of this contract the town was to pay 25 per cent. of the whole cost, the County to do the work and assume the remainder of the monetary obligation. Native field stone were to be used for the first course, and the stone crusher was accordingly set upon a cobblestone ridge about two miles from the work. A competent superintendent of construction, an experieced steam roller man and a stationary engineer for the crushing plant were employed, and one day early in May, with one guard allowed to eight prisoners, the work began. In the seven months following, the committee constructed two



PRISONERS AT WORK—KELLY SPRINGFIELD STEAM ROAD ROLLER

and one-half miles of macadam road by means of prison labor augmented by the employment of free labor when by reason of a scarcity of men under sentence such course was rendered necessary.

The roads have been built under the rule of State specifications, sixteen feet wide with a thickness of six inches on the tread. As aforesaid, the first course has been built of native stone crushed by prison labor, the second course and surfacing being of limestone purchased outside and brought in by rail. It will readily be seen that the enforced purchase of stone for surfacing has added greatly to the cost, an item of expense that could be much reduced in localities having nearby quarries of limestone or trap rock.

The cost to the county of these roads has been $5,000 a mile, which is approximately what they would have cost the county and town had they been built by the State under the provisions of the Higbie-Armstrong law.

NONE OF THE FEARS OF OBJECTORS HAS BEEN REALIZED

As to the actual working of prisoners under this plan, none of the bugbears of philanthropic penologists have been apparent. The labor unions have heartily endorsed the movement, there has been no recourse to shooting in the endeavor to recapture an escaping convict, the "hardening" process has not been noticeable, and most of the men have performed their work cheerfully. True, there have been some escapes, but even these have their bright side. That peculiar prisoner never returns to Schenectady county. As a rule the men are worked free, the ball and chain having been brought into use but once. Occasionally a surly convict refuses to work, but an application of the old theory that he who does not work should not eat, causes him to change his mind before many hours.

The labor performed as yet has not taken the prisoners a great distance from the jail to which they have been returned every night. The sheriff has given the committee his hearty co-operation, the event of the day being the noon-time coming of the "grub wagon" with its hearty meal of hot soup, vegetables, meat, bread and coffee. Able bodied prisoners are worked eight hours every day, Sunday excepted, and an average of twenty men daily have been on the roads since the work began. By working penitentiary prisoners at home, the county has retained $700 that would have gone out for board, and it has had the fruits of these men's labor.

In his report to the board of supervisors, Chairman Robison, of the Road and Bridge committee says: "In entering upon its duties, the committee fully realized its responsibilities which were rendered more grave by its limited knowledge of road construction, not to mention the many objectionable features with which it would have to contend. Many of these things have been solved to the satisfaction of the committee, and we trust to the satisfaction of the county taxpayers. Other matters of moment will have to be solved as work along this line progressses. * * * The prisoners, on the whole, were quite orderly while at work, in most cases preferring work to confinement in idleness. In almost every instance a good day's service was rendered. * * * The committee made it a point, where a prisoner became noted for faithful service and good behavior, to give him employment as a free laborer at the end of his sentence. Good results were thus obtained. * * * Guards were paid $2 per day, and also performed the functions of sub-foremen under the direction of the superintendent. * * * Employment is beneficial to the prisoner along the lines of good health and general conditions A term of imprisonment at hard labor leaves the prisoner in better condition to obtain an honest living. * * * With proper men serving on this committee, still better results will be obtained in the future."

Building roads with convict labor is still in the experimental stage in Schenectady county. The results of a seven months' trial are satisfactory, but not conclusive. The committee has yet to solve the problem of providing for prisoners during the winter months, but doubtless time will find the way, as it will eventually discover a system by means of which the question of providing jail inmates with employment at road building will be solved still more satisfactorily and still more economically.

TAXATION OF PERSONAL PROPERTY*

The System in Theory—Experience of Different States—Theory of General Property Tax Fallacious—Tax Drives Out Capital—Benefits of Exemption Universal

By Lawson Purdy

THE taxation of personal property in the United States is a survival of ancient methods, which other countries have outgrown; it becomes more unequal and unjust as our country increases in population and wealth. When large cities have grown up, and the land of the cities has become of great value as a site for working up raw material, storing personal property, and exchanging it; and when personal property has assumed new forms of an intangible character, such as bonds, stocks, and notes, it becomes impossible to tax it fairly, because it cannot be found and cannot be accurately valued. It then becomes disastrous to the welfare of the city to attempt to tax personal property, because taxation decreases production and tends to drive away personal property and population, which alone give value to city real estate.

The labor and skill required to make a reasonably fair assessment of personal property is simply appalling; the mere enumeration of some of the items of personal property which might be owned by any prosperous citizen is a sufficient demonstration of this. The difficulty of assessing all personal property in a large city is proportionately much greater than in small towns. In 1903, the number of individuals, corporations, and estates who were assessed in the City of New York, was 78,339; of these 37,687 appeared before the tax commissioners and swore that they had no taxable property in excess of their debts, and the whole number taxed was 40,652. This is a very small proportion of the total population, a smaller proportion than the same effort would have obtained in small towns. In thirty-two cities of Massachusetts, with an average population of less than 50,000 persons, the number taxed on personal property was 82,211. If the same proportion had been taxed in the City of New York, the number would have exceeded 180,000. The persons taxed in Massachusetts were put upon the assessment rolls by the same methods as those in use in New York, only 5 per cent. having made sworn returns as required by law. These results can only be attributed to the greater ease of assessment in smaller places.

As the New York laws are to-day, no wealthy man, who has proper legal advice, need pay any direct taxes on personal property. And if we are to trust the experience of other states, he cannot be made to pay on any large assessment. The fact is that, wherever there is any attempt to enforce the taxation of personal property, the burden falls, as Mayor Hewitt said in his message to the Board of Aldermen in 1888, "upon the estates of widows and orphans, on wards in chancery. Those who ought to pay the most of it pay the least, while the humble citizen, who is unable to 'fix up' his statements, is subject to the full amount of lawful taxation."

FAULT IN THE LAW NOT IN ITS ADMINISTRATION

Those who are inexperienced and rely blindly on the mistaken theory that to secure equality of taxation all kinds of property must be equally taxed, frequently claim that the fault is not in the law, but in its administration. It is generally conceded that the State of Massachusetts has unusually able and competent assessors, and that their work is performed, on the whole, better than in any other State of the Union, yet the proportion which the assessment of personal property bears to the assessed value of real estate varies greatly throughout the State. In some towns the proportion of personalty assessed is very small, being less than 5 per cent., in 1895, of the

* Digest of a recent paper. Mr. Purdy is the secretary of the New York Tax Reform Association, with headquarters at 52 William street, New York.

total valuation in Revere, Winthrop, Hull and Mashpee. In a few towns it is less than 10 per cent., and in a considerable number less than 15 per cent. of the total. These figures in comparison with some other Massachusetts towns are remarkable, for there are eight towns in which the assessed value of personal property exceeds the assessed value of realty. In Falmouth the personalty is 65 per cent. of the total, and in Lincoln 67 per cent. A commission appointed to inquire into the expediency of revising the tax laws of the State, in its report issued in October, 1897, says: "The taxation of personal property in the form of securities and investments is thus a failure. It is incomplete, uncertain, not proportional to means as between individuals, grossly unequal in its effect in different parts of the State. The experience of Massachusetts in this regard is the same as that of other states in the Union. Everywhere, without exception, the testimony is that this part of the system of general property tax is unequal, unsuccessful, often demoralizing to tax officers, always irritating to taxpayers."

New Jersey testifies to the same effect. A commission was appointed in that State by Governor Griggs to investigate the subject of taxation and reported in 1897. The commission says: "It is now literally true in New Jersey, as in other states, as has well been said by another, that the only ones who now pay honest taxes on personal property are the estates of decedents, widows and orphans, idiots and lunatics. * * * * The reports of our State Board of Taxation for 1893, 1894, 1895, speak of these things and decry them and like complaints have come to us from many sources."

Ohio Tax Inquisitor Law

It has been claimed by some that the administrative features of the law in the states so far mentioned are not sufficiently thorough and severe, but this reproach cannot be laid against the law in Ohio. In 1893 Hon. William McKinley, then Governor of the State, appointed a tax commission of four members, two being Republicans and two Democrats, but all expressing themselves in favor of continuing the tax on personal property. In their report they said: "The system as it is actually administered results in debauching the moral sense. It is a school of perjury. It sends large amounts of property into hiding. It drives capital in large quantities from the State. Worst of all, it imposes unjust burdens upon various classes in the community; upon the farmer in the country, all of whose property is taxed because it is tangible; upon the man who is scrupulously honest, and upon the guardian and executor and trustee, whose accounts are matters of public record."

In Ohio they have the most efficient and minute scheme of assessing all classes of property which has been devised in any state. Every citizen is bound under oath to make a complete return of his property in detail. If he declines to make the oath required by law a penalty of 50 per cent. is added. In addition to this they have what is called the Tax Inquisitor Law, which gives the county commissioners authority to make a contract with such persons who may give information which will result in personal property being placed upon the assessment roll. Under the act passed in 1885, applicable to Hamilton and Cuyahoga counties, the amount authorized to be paid to informers is 25 per cent., and under the general act passed in 1888, applicable to the entire State, the amount authorized to be paid is 20 per cent. of the amount recovered. The efforts of the tax inquisitors are principally devoted to ascertaining what foreign stocks and bonds are improperly withheld from the returns. The result of the severe listing law and of the inquisitor law has been steady shrinkage in the assessed value of personal property.

Beneath the cold figures we can see the ruin of character, the confiscation of hard-earned savings, the oppression of the industrious, and the certain concentration of wealth, which is always incident to an evil system of taxation.

Illinois Listing System

In the State of Illinois the statutes require personal property to be listed yearly according to the quantity owned on the first of May. Persons listed are required to make statement under oath and to deliver to the assessor an itemized schedule of the number, amounts, quantity, and quality of all taxable personal property in their possession or under their control. When any person refuses to make and verify the schedule required, it is the assessor's duty to list the property of such person according to his best judgment, and to add a penalty of 50 per cent. to the valuation; the person refusing being subject also to a fine of $200 as for a misdemeanor. In 1897 this system was a complete wreck in Chicago and was little better in the remainder of the State. Personal property in Chicago amounted to only 13.5 per cent. of the total taxable valuation of all property, and in the remainder of the State it amounted to only 17.7 per cent. Recently all attempts to obey the letter of the law was abandoned in Chicago, and for the tax upon personal property there has been substituted what is practically a gross revenue tax upon business.

Missouri Cities

Missouri is blessed by the same kind of a listing law as that of Ohio and Illinois. There are only four large cities in the State, and the iniquitous effect of personal property taxation is clearly shown by a comparison between the city counties and the remainder of the State, or between the city of St. Louis and one of the rural counties (1899). In the four city counties personal property amounts to less than 14 per cent. of the total assessed value of real and personal property, while in the remainder of the State it amounts to 28 per cent. In West Virginia there are no large cities, and, consequently, personal property pays a large share of the taxes, averaging for the whole State over 28 per cent.

Theory of General Property Tax Fallacious

An analysis of the assessment rolls of every other State of the Union will disclose conditions as bad or worse than those described. It is marvelous that a well-sounding theory should have so long deluded the practical American people. The theory that taxes to be equal must be equally laid upon all property must have a good sound to many people or it would not have prevailed so long as the basis of tax legislation in this country. It has been proven that the ingenuity of man is unequal to the task of framing an equitable system based upon this theory, and that in itself is conclusive that the theory is false, for there is no such thing in this world as a true theory that will not work; but this theory may be proved false on purely theoretical grounds, for it neither conforms to the test that taxes must be in proportion to ability to pay nor to that other test, which seems to me to be the true one, that taxes should be in proportion to the benefits received from government.

Personal Property Tax Drives Out Capital

The impracticability and inequality of personal property taxation have been discussed, but its effect in driving out capital has been referred to only incidentally. This is an important effect, and is particularly important to owners of real estate. Personal property is easily transported, and will fly away from oppression wherever there is a refuge. The laws of our states differ so much that no state can legislate for itself without taking into account the laws of other states which surround it.

There is abundant testimony that capital has been driven from New York by oppressive taxation, and when capital is driven away population goes with it.

Tax on Manufacturing Plants a Tax on Consumption

One of the worst features of the taxation of personal property is the taxation of manufacturing plants. Such a tax if generally imposed must increase the cost of production and so increase the cost of goods. This makes it a tax upon consumption, which is always heaviest on those least able to pay. If the tax is not imposed by all states, it will operate as a discrimination against manufacturing industries in those states where it is imposed.

Tax on Chattels Double Taxation

It has been proved that it is impracticable to assess chattels of any kind fairly, but it is unjust to tax them at all, for such taxation is a double tax upon the owner. There is a law of nature which is superior to the laws of courts and legislatures, a law of nature which imposes a tax upon all chattels, with absolute fairness and with absolute impartiality. No man can possess any tangible thing without paying for land upon which it may rest, and for shelter with which to cover it.

One result of attempting to tax chattels is not understood nor is its importance appreciated as it should be. Goods and merchandise are not only taxed when they are in the hands of the consumer, but also in all the stages of their manufacture, and the different articles entering into the final product may also be taxed several times.

Tax on Mortgages Increases Interest

The taxation of mortgages is about the meanest kind of double taxation there is, for it singles out the man who is in debt to impose upon him a special burden with no resulting benefit of any kind. If by stringent provisions of the law all mortgages are taxed, there is a certain equality in the iniquity, but the general rule is that only occasional mortgages are placed upon the assessment roll, as in this State.

Professor Carl C. Plehn, in his work on the "General Property Tax in California," proved that the tax is regularly shifted to the debtor, together with something more by way of insurance against a possible rise in the tax rate. There is a still further burden upon the mortgagor because his property is invariably more sharply assessed than unencumbered property.

In most of the states only a small proportion of mortgages has been actually taxed, and the rate of interest in such states is affected rather by a risk of taxation than by a certain charge on the mortgage. Another element which affects the interest rate on mortgages is the fact that savings banks in New York can loan money on mortgages entirely free from taxation, and in Massachusetts and other states savings banks pay only a small tax in proportion to individuals. Those states, therefore, which exempt mortgages from taxation altogether do not show an interest rate which is lower by the full amount of the average tax rate; moreover, when interest rates in states which now exempt mortgages from taxation are compared with interest rates in the same states prior to exemption, allowance must be made for the previous uncertainty of the tax.

In Massachusetts mortgages were exempted from taxation in 1881, and the tax commission of 1897 says: "We believe that the change in the tax law made in 1881 has tended to bring about a decline in the rate of interest on mortgages, security being the same; and this decline has been as great as could be expected in view of the conditions prevailing at the time the law was changed."

The impression seems to prevail in some quarters that the exemption of mortgages from taxation would be a special benefit to those who lend money. So far from this being the case it seems probable that many who now lend money on mortgage security and escape taxation would really receive a smaller net return by reason of the greater competition in the loaning of money. The benefits really would be so widely diffused that all classes in the community would participate in them.

Taxation of Banks

The taxation of banks is one of the strongest features of the laws for the taxation of personal property in most of the states, and in consequence it has probably done the country more harm than the attempt to tax any other item of personal property. It is now a matter of theory that there is a very widespread feeling that the supply of currency is inadequate for business needs. This feeling is strongest where the taxation of personal property is most effectual. If banks are virtually prohibited, there never will and never can be currency enough to effect exchanges. If the prohibition against branch banks, as in New York, and the taxation of banks were abolished, there are thousands of small places where branch banks could do a profitable business, and set free an amount of currency that it is impossible to estimate.

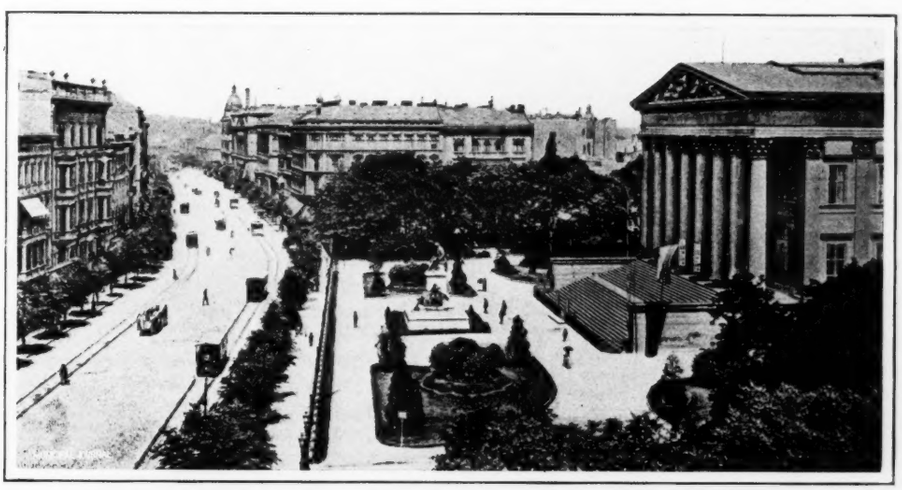
Closely related to the tax on banks is the tax upon currency. First, banks are taxed so as to render necessary a larger supply of money; more money is demanded and, at the same time, a tax is laid upon the money which, if it be actually assessed and collected, would drive money out of circulation.

Benefits of Exemption Universal

The idle fear that to exempt personal property from taxation is to benefit only a class, is born of ignorance and prejudice.

Sufficient facts have been presented to show that the taxation of wealth instead of opportunity is not a tax upon rich men, but a tax upon brains and industry, and honesty and thrift. The exemption of personal property from taxation is one of the few reforms that can be effected without injury to anyone, and with benefit to every class and every individual.

The owners of real estate are the only ones who have even the shadow of a right to object, and one-third of them pay more personal taxes than they would pay in increased taxes on real estate if personal property were exempt; all the remainder would benefit in reduced prices of goods, and in an increased demand for labor. All those whose real estate is mortgaged would benefit in decreased interest charges. All real estate would tend to rise in value, for population would be attracted and the productive capacity of the people increased. Real estate has value in proportion to the number and productive capacity of the population; it has its greatest value where there is the largest amount of the most valuable personal property placed upon it. When the production of wealth is no longer punished by fines and penalties, real estate owners will get their share of the general prosperity. In addition to these considerations, the improvement in the morals and conscience of the community which would ensue from the abolition of this terrible temptation to perjury and fraud is worth the earnest effort of the greatest statesmen.



RING BOULEVARD, BUDAPEST, REPLACING ANCIENT CITY WALL

CIVIC ART IN NORTHERN EUROPE*

Value of a Comprehensive Scheme—"Ring" Boulevards—Variety of Street Plans—Street Embellishment—Tree Planting

By Milo Roy Maltbie

The cities visited were Copenhagen, Stockholm, Helsingfors, St. Petersburg, Moscow, Warsaw, Budapest, Vienna, Dresden, Berlin, Hamburg, Altona, Cologne, Brussels, Antwerp and Paris. Several days were spent also at the Dresden Municipal Exhibition. Maps, plans, prints, photographs, books and pamphlets relating to city embellishment in its many phases were secured from each city, which form as complete and as comprehensive a collection as exists upon this side of the Atlantic. When classified and thoroughly indexed, it should be of great usefulness, not only to city officials, but to artists, architects and private individuals interested in city embellishment. The work of collecting the material and data was greatly simplified by the generous courtesy of Secretary Hay, who placed the Consular service at my disposal, and of his honor, Mayor Low, who secured the co-operation of foreign city officials.

The experience of European cities upon many essential features is a unit. It uniformly condemns, for example, the haphazard location of public buildings in narrow by-streets, and it uniformly approves the erection of monuments and fountains at the intersection of prominent thoroughfares. But every European city has not been equally successful in the selection of locations for its public buildings and monuments, in the arrangement and embellishment of its parks and open spaces, or in any of the many directions that public art has expression. Usually some one city has excelled all others in certain phases, and more attention will be given in this report to these preeminently successful instances than to others which are simply satisfactory and worthy of hearty commendation.

MUSEUMS AND VOLKSGARTEN, VIENNA
Showing Treatment of Parks and City Buildings

Foreign Cities at a Disadvantage

In some respects the cities of Europe have been at a disadvantage. City building (Städtebau) has undergone revolutionary changes in the last half century. Comprehensive systems of sewerage, lighting, water supply, transportation, etc., scarcely antedate 1850. Streets, once sufficiently wide for the ebb and flow of traffic, are too congested now, and conditions which were once assumed to be good enough are not now tolerated. The sordid ugliness, formerly accepted as the inevitable attendant upon certain phases of city life, is now generally condemned, and steps are everywhere being taken to infuse beauty even into the most congested and forbidding quarters of our cities. To meet these new requirements is evidently much more difficult for an old city, with an established ground plan inherited from the antiquated past, than for a young city which may draft its street plan and formulate *de novo* its building regulations.

Such was the disadvantageous position of almost all European cities when the movement for civic betterment started. The centre of urban life originally was the castle, the church, the marketplace or the palace, and around these a town grew without thought or plan. The necessity for fortifying the town and the consequently high value of land within the city walls compelled the utilization of every nook and corner, and as the town grew in population, congestion and filth outran all else. When the necessity for dealing with these conditions became apparent the situation was a most difficult one with which to deal. Not only was it imperative to condemn and reconstruct individual buildings, but the street plan of the city had often to be rearranged, new thoroughfares to be cut through crowded quarters, old streets widened and tortuous windings straightened. This work had to be done first, for no comprehensive scheme of beautifying the city could be projected until the ground plan had been determined. The changes in the street plans of European cities will be considered first in this report.

Reconstruction of Paris

Probably more has been done in Paris in this direction than in any other city. The work was begun under Napoleon I., but the longest strides were taken after Baron Haussmann began his gigantic schemes involving the reconstruction of the whole city. From year to year the work has been continued. New streets and avenues are constantly being opened, every quarter has or has had its improvement scheme, and the foreigner who visits Paris only occasionally finds a new city at each visitation. Millions of francs are spent annually to let light and air into congested neighborhoods, to improve transportation facilities and to create boulevards and open spaces. As a result, Paris has a finer system of boulevards than any other European city, and its world-renowned beauty is largely due to these spacious tree-lined avenues, parks and open spaces that are being multiplied and made more beautiful from year to year.

One of the most admirable features of this work is the systematic and regular way in which it is carried forward. Plans are drawn and adopted far in advance. As fast as funds are provided and the property can be acquired at a reasonable figure, the schedule is pushed along, not spasmodically, but steadily, systematically and keeping pace with the growing needs of the city. It will be at least ten years before the plans now adopted on paper will actually be

* This is a series of four articles, comprising the special report to the Municipal Art Commission of New York City by the assistant secretary, Dr. Milo Roy Maltbie, as the result of studies and observations made in the summer of 1903. It cannot fail to have an intrinsic value to all American cities.—[Editor.

carried out, and long before these are completed others will have been prepared for still further improvements.*

Value of a Comprehensive Scheme

The advantage of laying out the street plan in advance of population may also be illustrated by reference to a Brussels suburb. The city officials, noting the steady growth of the town, perceived that in a few years houses would be springing up in this new locality. Recalling the bad effects of haphazard expansion and the great expense of rearranging streets after a district is built up, they attacked the problem in advance, with most excellent results. A beautiful park was laid out with trees, fountains, statuary and floral displays. Diagonal streets with pleasing vistas were provided. Streets of generous width and well adapted to rapid transportation followed. Focal points were emphasized by grass plots with sites for monuments or statues. Trees were planted along many of the less important streets as well as the boulevards. A new suburb was thus planned from its inception with comparatively little expense and no inconvenience to the public.

The wisdom of adopting a general scheme which may be modified in detail as occasion requires, but which will be planned in its general features in advance of urban growth, executed as rapidly as possible and in harmony with which parks will be constructed, monuments erected, public buildings located and other structures provided, is evidenced by foreign experience. There is continuity and harmony in the various improvements, and the work accomplished by each generation does not need to be undone by a succeeding generation. Instead of conflict, each additional improvement adds far more than indicated by its cost, and the improvements already carried out give tone and character to the new work, which would be lacking if there were no interdependence and if they had been carried out in a haphazard way. Few European cities were so fortunate in their early history as to have a well thought-out plan, and whatever of systematic arrangement has been since introduced is of recent date.

BARBAROSSA PLACE, COLOGNE
Showing Method of Treating Street Intersections

No change has been more common than the transformation of outgrown fortifications into wide promenades or a succession of parks. Generally, one can trace the site of the old walls by this circle or series of concentric circles of boulevards. Among the most beautiful (besides those of Paris already mentioned) are those of Brussels, with their four or six rows of wide-spreading trees, grass-plots, walks, bridle paths, frequent benches for pedestrians, appropriately located fountains, monuments and statuary at commanding centres, and broad avenues running out in every direction from focal points to afford rapid communication with the suburban districts and shady walks and drives for the people living in the neighborhood; of Cologne, where the city is girded by a continuous succession of small parks, boulevards and plazas with floral displays, green sward, monuments, fountains, ivy-twined bits of the old city walls, and other adornments; of Bremen, where the configuration of the fortifications is still seen in the winding lake and the irregularity of the parks; of Hamburg, where the ring parks are very spacious, where the moats have been turned into lakes, where the irregularities of the old fortifications have been utilized to give variety and rusticity, and where many public buildings have been located either in or bordering on the parks; not to mention the less magnificent but quite successful ring boulevards in Budapest, Prague, Cracow, Leipsic, Breslau, Gothenburg, Copenhagen, Nijny-Novgorod, Moscow, and the many French cities patterned after Paris.

The grandest and most comprehensive scheme is in Vienna. Like other cities, it had in 1857 very elaborate fortifications, beyond which the city was rapidly extending, rendering them of less and less value as a protection against invasion. Soon after the accession of Francis Joseph, he ordered their removal, and out of the three-cornered fight over the disposal of the land, between the City of Vienna, the Kingdom of Austria and the Crown family itself, a very fortunate compromise was arranged. A portion of the immense area formerly given over to the walls, moats, glacis and drill-ground was to be laid out in broad, tree-lined boulevards girdling the inner city, a portion to be made into parks, a portion used as sites for public buildings, and still another portion (so vast was the area) sold to provide funds out of which to construct artistic public buildings. The whole scheme was so intelligently planned, including the treatment of the park areas and the ring-strasse, the location of the public buildings with adjoining open spaces and parks, the erection of appropriate monuments at vantage points, and the branching of other boulevards at proper places, that there is nothing of the kind in all Europe that is more imposing, more harmoniously effective, or more artistic. Although begun and in large measure completed many years ago, improvements improvements and extensions are being made from year to year.

St. Petersburg—A Modern City

Of all European cities of importance, St. Petersburg has probably had least need to reconstruct its street plan. This is due principally to its youth (St. Petersburg celebrated its 200th anniversary at the same time New York commemorated its 250th birthday) and to the foresight of Peter the Great and Elizabeth, who made most of the principal streets of great width and laid out many open spaces in the very first days of the city's history. By so doing they secured for the city, at little cost, what other cities, because of the lack of foresight and appreciation upon the part of their early rulers, have been compelled to purchase at great expense and inconvenience. St. Petersburg vies with Paris as regards the generous width of the streets and the expanse of open space.*

Variety of Street Plans

The street plans of European cities show the greatest variety. No two cities are exactly alike. Amsterdam and Budapest have series of streets forming concentric semi-circles with the waterfront as a diameter and another series of radiating streets. Antwerp has a similar system, but with less regularity and a larger number of small streets running in every direction. Brussels has a ring boulevard

* Under the law a tenant who has an unexpired lease is allowed generous damages if the city takes the property he is occupying before the lease expires. Consequently, a building is often allowed to stand, although impeding the completion of the scheme, until the lease expires, by which means a considerable saving is made to the city.

* The creation of such large blocks makes interior courtways necessary to afford light and air. Here one finds what very closely resembles our "rear tenement," with no direct access to the street—a hospitable retreat for the dirty and criminal classes. In many cases these interior courts are utilized as gardens, which are very attractive and refreshing.

bounding the inner city, with avenues radiating not from the centre of the city but from the ring, one wide boulevard running through the business centre connecting the two principal depots, one at the south and the other at the north, and a few other boulevards connecting the smaller nerve centres of the city. Vienna, Moscow, Dresden and Leipsic resemble Brussels, except that the central portion of these cities cannot boast of such fine new boulevards as Boulevard Anspach. Karlsruhe has a system of radial streets diverging from the Schloss with almost mathematical precision, overlaid with a few rectangular streets. In Paris one finds concentric rings of boulevards, a system of avenues radiating from the Louvre and Place du Châtelet, and still others radiating from such important local centres as Place de l'Etoile, Place de la Bastille, Place de la République and Place d'Italie. Stockholm, St. Petersburg, Hamburg,

It is also advisable that boulevards should be so planned as to connect the parks of a city. Such parkways may be so treated as to become small parks in themselves without interfering with their use as thoroughfares. Witness Rue de la Loi connecting the Royal Park with Parc du Cinquantenaire, or Avenue Louise, Boulevard de Waterloo and Boulevard du Régent binding together the Bois de la Cambre and the Royal Park in Brussels, or the Johann Georgen Allee extending from the business centre of Dresden to the Grosse Garten, and Andrassy-strasse similarly situated in Budapest.

The water front of the city also offers an excellent location for promenades or boulevards, as instanced by the much-frequented Lange Linie along the harbor of Copenhagen, Strandvägen in Stockholm, the Franz Joseph Promenade along the Danube in Budapest, Boulevard Frère-Orban bordering the Meuse in Liège, and river

STREET IN BRUSSELS, WITH THE MASSIVE PALACE OF JUSTICE CLOSING THE VISTA

Cologne, to some extent Berlin and most other cities of importance, have avenues varying in size and importance which approach a common nucleus—the business centre of the city. Stockholm possesses the rectangular system, but the axes of different sections are not parallel, so that there are many streets that make acute angles in crossing. Still other cities have such a mixture of short streets, twisting and turning, that it is impossible to find that there is any system whatever. This is true of the older cities and the older portions, but seldom of the new suburban areas or of schemes adopted in the last half century.

Principles Suggested

Local conditions—inherited street plan, topography, the location of railroad stations and many other factors—determine which of these plans is best for any particular city, but quick transportation demands the development of civic centres with a system of avenues radiating from the business and other important local centres, and toward this end European cities are working. Such a system also adds to the attractiveness of the city, for the focal points afford good locations for public buildings and monuments.

streets in other cities, especially Amsterdam, where the canals are generally lined with at least one row of trees on each side.

Street Embellishment

European experience further demonstrates that it is not vital that an avenue or boulevard be laid out in a straight line for a long distance. Indeed, there are few prominent thoroughfares that continue an unbroken line for such a long distance as does Broadway from Bowling Green to Grace Church. This is partially due to conditions which could not be remedied, such as an inherited street plan of crooked streets, and partially to the avowed intent of those who laid out the new avenues. The street that runs straight ahead for miles, approaching only a blurred and characterless horizon, is not to be compared as regards its artistic merit with the avenue which varies its course and thus permits the eye of the traveler to rest upon a column, an arch, a fountain or a facade of a public building. Imagine the Avenue de l'Opéra without the Paris Grand Opera House at its terminus, Rue Royale without the Madeleine, Avenue Victoria without the Hôtel de Ville, the Vienna Burgring without the Parliament building, the Reichsrathstrasse without the Voitiv

Kirche, the Alsterdamm, Hamburg, without the new Wilhelm I. monument and City Hall; Unter den Linden without the Brandenburg, Gate, Rue de la Régence, Brussels, without the Palace of Justice at one end and the statue of Godfrey de Bouillon at the other, and hundreds of other instances from every nook and corner of Europe.

Where there is a long, straight boulevard, the most artistic results have been obtained by the erection of columns, arches, fountains and statues at frequent intervals to break the monotony of the view. The distance between these should not be great. As soon as one is out of easy view, another should rise. An instance of the artistic effect of this sort of treatment is the Avenue des Champs-Elysées and the promenade through the Jardin des Tuileries, where the monument to Gambetta, the Arc de Triomphe du Carrousel, the Obélisque de Louqsor, the Arc de Triomphe de l'Etoile and several fountains at frequent intervals not only add immensely to the beauty of the avenue, but in turn are benefited by the avenue which adds to their beauty. Other well-known instances are the multiplicity of monuments, statues and fountains in the ring boulevards of Paris, Brussels, Antwerp, Cologne, Vienna, Copenhagen, Moscow and other cities, and in the focal points of the street plan of Berlin, Dresden, Budapest, St. Petersburg, etc.

The location of public structures is being given the thought and thorough attention it deserves, and the value of beautiful vistas is more and more being appreciated. If there is one thing for which one may be thankful for the jumble of streets that characterizes the older portions of European cities, it is that many vistas are thus provided.

Tree Planting

That trees and green grass plots should be used upon all streets and avenues wherever possible is so apparent that it hardly needs mention. Nothing adds so much to the beauty of a street or so tempers the heat and glare of hot summer days as lines of wide-spreading trees and plots of green grass with an adequate supply of benches for those who wish to rest and enjoy the changing scenes. The ample provisions made by many European cities have turned many boulevards into continuous park systems.

At frequent intervals the avenue is often widened into a *rond point*, a circle or a square with flowers, shrubs and statuary, which form a pleasing terminus for intersecting streets that may be too narrow to have trees of their own. Objectionable structures for the convenience of the public are hidden by clumps of bushes and trees, and trolley tracks, whose presence upon the boulevards is imperative to accommodate the traveling public, are almost hidden by lines of trees, which also furnish cool shade and make a car ride doubly pleasant. They also hide trolley poles, if overhead wires are used, and smother the noise made by the cars.

To prevent ugly breaks in the symmetry of tree-lined avenues, dead trees should promptly be removed and others of the same kind and size inserted. In some European cities there is carelessness, with most inartistic results, which contrast sharply with the harmony, symmetry and beauty of such boulevards as the Wienerstrasse in Dresden, Avenue Louise in Brussels, Avenue du Bois de Boulogne in Paris or the Prater-strasse in Vienna. Even the historic Unter den Linden is marred because of the failure to replant in harmony.

(*To be continued*)

THE WATER WORKS OF BOMBAY

A description of the water works of the city of Bombay, India, was given by Mr. A. F. Bruce, water engineer of that municipality, in a lecture at the Young Men's Christian Association.

He said that from time immemorial Bombay had possessed a large number of tanks and wells constructed by devout citizens for the good of the public. In these people washed their clothes and themselves, drank of the water and carried it home for their domestic supply. It is not surprising that Bombay had a bad reputation for cholera and typhoid. The scarcity of water necessitated efforts being made for an increased supply. In 1824, upon the occurence of a water famine, an inquiry was started, but nothing was done until 1845, when proposals were made for impounding a surface drainage of the hills in and about the city. It was also proposed that tanks be constructed from which water could be pumped through pipes to different parts of the city. In 1855 the construction of Vehar Lake was commenced and this was completed in 1858, a supply of 11,000,000 gallons per day being obtained. This supply proved insufficient after several years, and in 1866 meters were introduced with good results. At that time about 3 per cent. of the supply was metered. In 1878 the lake was completed in the Tulsi Valley, and settling tanks and a service reservoir constructed on Malabar Hill. Four filter beds were afterwards built there, to which three new ones were recently added. In 1886 a Tansa scheme for a new supply was started and completed in 1892. As showing the present supply of the city, Mr. Bruce gave some details of the different lakes:

Tansa Lake is 55 miles from Bombay, has a drainage area of fifty-two and a half miles square miles and is five and a half square miles in extent, with a capacity of 18,000 million gallons, or sufficient to supply forty million gallons per day. The main dam is of masonry and could be raised, if necessary, fifteen feet, increasing the storage capacity to 30,000 million gallons or a supply of seventy million gallons per day. The average rain fall in this section is about 108 inches. The large size of the catchment area permits of a rain fall of thirty-three inches filling the lake. Water is drawn off by means of five sluices at different levels. Water is taken as near the surface as possible, as it is purest in the upper stratum. The aqueduct consists of a masonry channel seven and one-fourth feet wide and six feet deep with an arched roof. It has a fall of six inches to the mile and can discharge about forty-two million gallons per day. Difficulties in crossing the valleys prevent the full capacity of the aqueduct being used.

Vehar Lake has a drainage area of 3,900 acres, of which 1,400 are covered with the lake. The lake contains 8,800 million gallons and has earthern embankments. Water from this can also be taken at five different levels through forty-eight-inch pipes which have large bell mouthed openings, over which copper wire gauze has been placed to exclude foreign substances. As in the case of Tansa Lake, ample outlet has been provided for any large flood.

The third and smallest source of supply is from Tulsi Lake. This lake is very high and the water from it can supply all the hills in the city. The quality of the water from this lake is not good, due, no doubt, to its small size which does not allow much time for sedimentation, and also to the absence of weed which would absorb the algae, as in the case of the other lakes. Another cause of bad water is assigned to the prevailing winds, which blow in the direction of, instead of away from, the outlet. The catchment area comprises 1,714 acres, including 330 of lake surface. The rain fall averages 104 inches. The water is carried in a twenty-four-inch main to Malabar Hill.

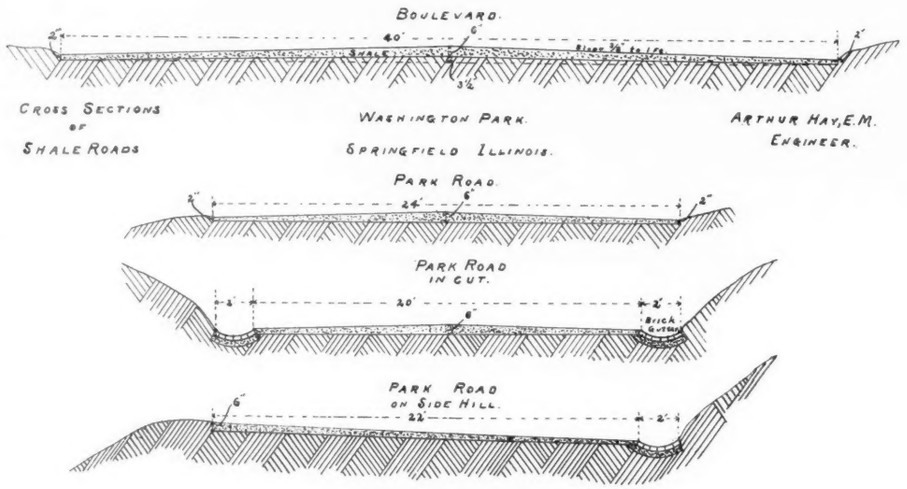
The principal works on Bombay Island are the filters and reservoir of Malabar Hill and Bhandarwada; at the latter place nine filters have been installed. The whole filter area in Brandarwada is 15,560 square yards, with a capacity of seven and one-half million gallons per day, with seven beds working, and two in reserve. The reservoirs have a storage capacity of twelve million gallons.

The total supply brought in and distributed amounts to from thirty-five to thirty-six million gallons per day, or about forty gallons per capita for all purposes. As fifteen to twenty gallons per head is an ample allowance, in the opinion of Mr. Bruce, and as the great bulk of the population uses but six or eight gallons, a great waste is prevalent. In his opinion, the only cure for this waste is to charge a water tax almost exclusively by meter measurement.

HOW ONE CITY BUILDS ITS PARK ROADS

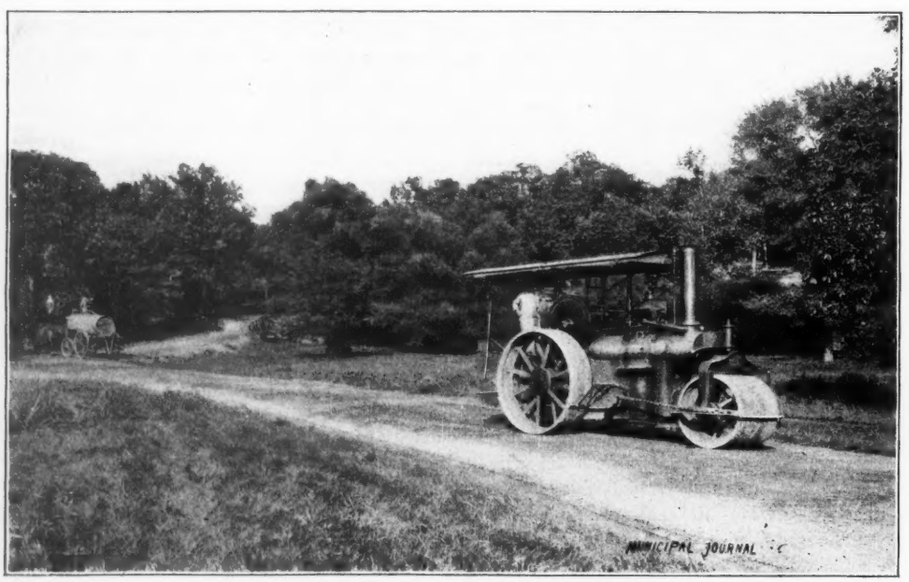
Beautiful Boulevard and Park Economically Laid Out—How the Shale Roads Were Built—Road Machinery Saved Money

In many instances the establishment of a park system is accompanied by a large expenditure of money for improvements to produce by artificial means "natural features," but when the committee having in charge the matter of securing sites for the park system of Springfield, Ill., began to look around for suitable situations, it was able to obtain a tract of ground containing "natural features" as Nature herself had made them. Thus the matter of expense was largely reduced. The tract of land that was secured was covered by a natural growth of timber containing splendid specimens of forest trees and required but the clearing out of brush and fallen logs to show the beauty of hill and dale. The park area was purchased in 1900 and since then additional small areas have been added to round out the boundaries of the original tract. This was the beginning of a park system for Springfield and, having once realized the advantages to be derived from parks, the citizens will see to it that the boundaries of the present park are continually enlarged or other sites secured in proportion as the need for breathing places is felt. Land for a boulevard was also secured and contained an area of 18.17 acres. The park itself comprised 132.16 acres and was named Washington Park. Williams Boulevard, as the driveway was called, leads to the park and forms a direct entrance into it. The report of Mr. Arthur Hay, the engineer of the Pleasure Drive way and Park District which is in charge of the park system, tells of the work that was necessary to place the ground in condition for use.



The first work was the clearing of the timber from the roadway of the boulevard. This was mostly black walnut, hickory and oak and, as the trees were grubbed before they were felled, the weight of the branches helped to pull the stumps out of the ground. The wood was used for rustic bridges, benches and fence posts. In the park roads few trees were removed, the roads being frequently built around fine specimens. Following close behind the gang that was attending to the trees came the grading gang which started the road building. The work was done with wheeled scrapers, made by the Western Wheeled Scraper Co., Aurora, Ill., and tile culverts were laid in the bottom of the draws. The finishing cut and crown of the road was secured by means of road graders, supplied by the Indiana Road Machine Co., of Ft. Wayne. Plows and scrapers were used to shape the banks and these were finished by hand.

Inasmuch as the ground through which the roads were built consisted of loam and clay, it was necessary to place a top dressing on them to make them suable at all times. Gravel was not obtainable in the neighborhood and cost as much as broken stone to import, so that macadam was fixed upon as the best road material. The finances of the board would not permit of the laying of four miles of macadam during the first year and so it was decided to substitute a material that would make a fair road and might be used as a base for the macadam when it was possible to lay the same. This was the so-called "shale" from the mine dumps in the vicinity of Springfield. This material could be had for the hauling. The oxidation of the slack coal and sulphur in the dump burns this as hard and of about the same color as fragments of drain tile. It cost 10.8 cents per square yard to place this on the road, water and roll it. The shale was rolled to a thickness of six inches at the center and two inches at the edges, with a uniform slope of three-eighths of an inch to the foot. While this was rather flat for macadam it was found that where the crown was increased to three-fourths of an inch to the foot, the shale was furrowed transversely by the water rushing to the gutters. The shale was laid in this thin layer as it was intended to cover it with broken stone. It was also important to get all the roads covered the first year and so the shale was stretched over as much ground as possible. For a permanent road Mr. Hay is of the opinion that the shale should be eight inches thick in the center and four inches on the edges. Inasmuch as the



KELLY-SPRINGFIELD ROAD ROLLER IN WASHINGTON PARK, SPRINGFIELD, ILL.

shale roads were wearing well at the last reports, it is possible that the broken stone would not be used after all and the present layer of shale increased to the necessary thickness. A six-ton reversible horse roller was at first used, it having been borrowed from the city, but it was soon apparent that it was not working as economically as would a steam roller. Accordingly, a ten-ton steam roller was purchased from the Kelly-Springfield Road Roller Company, of Springfield, O. It was found that, while the horse roller required 314 hours to compact 2,533.5 cubic yards of shale at a cost of 9.6 cents per cubic yard, the steam roller rolled 4,030 cubic yards in 350 hours at a cost of 2.9 cents per cubic yard. Thus a saving of 6.7 cents per cubic yard was secured to say nothing of the fact that the steam roller compacted the shale much better than the horse roller. After a hard winter the shale roads remained hard; only in the spring when the frost was coming out of the ground did they soften and it was necessary to prohibit driving on them. When the thawing was done, the shale hardened without further rollling. The heavy spring rains so washed out the gutters that it was necessary to pave them with brick. The dull red color of the shale roads has proved a pleasing contrast to the green of the foliage and is greatly admired.

Mr. Hay gives the cost of grading with road grader for the park road, which was twenty-four feet wide and 12,430 feet long, at 1.6 cents per lineal foot. He gives it in this form rather than by the cubic yard of earth removed for, he says, "It is a fact well known to contractors that, it costs more per cubic yard to grade a road through a shallow cut, say a foot or less, than where the cut is deeper, although in the latter case more earth must be moved per foot of road. Where the cut was deep the moving of the earth cost from 15 to 26 cents per cubic yard depending entirely on the length of haul; the former figure being for a wheeled scraper haul of about 300 feet and the latter for a wagon haul of about 1,500 feet." Laborers were paid $1.50 for an eight-hour day and a two-horse team and driver $3 a day. Dump wagons holding one and one-half cubic years were used.

Some details of the cost of building the park road will be interesting. Clearing and grubbing cost $40 per acre or 1.2 cent per lineal foot of road; plow scrape and haul dirt, 23 cents per foot; grading with road grader, 1.6; sloping banks, 6 cents; giving a total cost for grading of 31.8 cents per lineal foot. Covering with shale cost 30.2 cents. The total cost of grading per square yard amounted to 11.8 cents, of shaling 11.3 cents and the total cost of road per square yard 23.1 cents. The cost of the shale per cubic yard was as follows: Stripping, 1.8 cents; loading, 15 cents; hauling two miles, 50 cents; dumping and spreading, 6 cents; rolling (horse roller 9.6 cents and steam roller 2.9 cents), 5.4 cents; sprinkling by sprinkling cart obtained from the Studebaker Bros. Manufacturing Company, of South Bend, Ind., 1.8 cents; total, 80 cents. One cubic yard of loose shale covered eight-tenths of a cubic yard after rolling, or seven square yards of road.

NORTH DRIVE, WASHINGTON PARK, SPRINGFIELD, ILL.

MR. G. A. PARKER, SUPT. KENEY PARK, HARTFORD, CONN., IN HIS OFFICE, WHERE HE HAS ON FILE A MASS OF DATA ON PARK SUBJECTS

PLAN FOR MUNICIPAL HOME RULE

Scheme Proposed to Pave Way for This Result—Definite and Prompt Responsibility to the People Assured

A SCHEME for proposed legislation looking towards home rule in Greater New York has been mapped out by a Special Joint Committee on Franchises and Legislation of the Citizens' Union of that city. Other municipalities throughout the country are fretting under the restrictions placed upon them by their State legislatures which do not permit them to control those matters that are eminently municipal and are vitally important to the development of the cities in question. Therefore, this scheme will be of interest to them for its scope and not be confined to New York alone.

The charter of New York does not merely prevent it from helping itself but prevents the city's securing private aid in providing for public needs. To grant the city the proper powers the State constitution must be amended and cities of the first and second class are urged to support such an amendment. In the opinion of the committee the scheme presented has the advantages of making simple and direct all steps to be taken in these matters and of enforcing definite and prompt responsibility to the people most concerned; of including no item as to which precedents of both public and private operations are not abundant, giving such scope for experiment as to ensure development in the directions that shall have been approved by practice; of keeping the city administration so constantly face to face with the citizens as will insure the best efforts of the former and the best vigilance of the latter.

The scheme proposed is as follows:

I. CONSTITUTIONAL AMENDMENT

(*a*) The city should be empowered, by direct operation or contract, to provide for the following public services within its corporate limits:

(1.) Street, etc., railways—whether surface, elevated or subservice.

(2.) Sewers and water, gas (for light and fuel) and electricity (for light and power) supply.

(3.) Bridges, ferries and docks, including warehousing and graving.

(NOTE.—Other services will certainly be needed, and some might now be included. Inasmuch, however, as this Constitutional Amendment would rather define the policy of the State than curtail present powers, constitutional provision therefore might well wait—being now made only for services which experience has shown the city should provide for.)

(*b.*) The State Legislature should be deprived of power to legislate in these regards—except in special cases, by concurrence with the local legislature.

(NOTE.—How far such concurrence should be required, or on the other hand, the city be left independent, may be a question. It is clear, however, that the Legislature should have only permissive power, if any; and that to the city should at least be secured the initiative as well as immunity from outside interference in its local concerns.)

(*c.*) It should be provded that in estimating city indebtedness in connection with limitation of the city's power to add thereto, investments in public service plants or working capital therefor should be excluded; *provided*, (*a*) that they shall have been authorized by popular vote on referendum, and (*b*) that such shall not aggregate more than 5 per cent. of the assessed valuation of taxable real estate in the city.

(NOTE.—It may be argued that an investment, whether profitable or otherwise, should be considered as such in estimating public as well as private assets.

The debt limitation, however, is based upon a different theory; our suggestion is intended not to antagonize the theory, but to prevent its application to cases not contemplated when our present Constitution was framed.)

II. GENERAL LEGISLATION (IF NOT BY CONSTITUTION, CHARTER, ETC.).

(*a*). The city should be forbidden to lease the franchises or plant of any service, or to bind itself by and contract in regard thereto, for a time aggregating, including renewals—

(1) More than twenty-five years;

(2) Or for more than ten years, except in accord with a vote of citizens on referendum;

(*b.*) (3) Or at all, except on definite terms, on which, at any time, the city may assume operations.

(*c.*) The city should be empowered to condemn at its fair value—depreciation allowed for—all real property or franchise rights now or hereafter used in operation of any public service, or needed therefor—in such case title and possession to vest in the city at institution of proceedings to condemn.

(*d.*) Referendum should be provided by which voters at any general election may decide between public and private operation of services.

(1) On initiative of city authorities—published at least thirty days before Election Day;

(2) On petition of 10 per cent. voters at last registration—filed at least sixty days before Election Day. Such decision obligatory when had.

(*e.*) Definite provision should be made for extent to which details might be settled:

(1.) By regulation on the official directly in charge.

(2.) By local ordinance; or

(3.) By legislative concurrence in local ordinance, respectively.

III. ADMINISTRATIVE METHODS (CHARTER PROVISIONS OR LOCAL ORDINANCE)

(*a*). Provide for a city official "Director of Public Services" (appointed and removable by the Mayor), constitute him head of a Department of Public Service.

(*b.*) Put under this Department three Bureaus—(1) of Water, Gas, and Electricity Supply; (2) of Street and Tunnel Transport; (3) of Docks, Bridges and Ferries—each to be in charge of a commissioner to be appointed by the Director, and to be head of a full bureau staff—administrative and engineering.

(*c.*) Distribute among these bureaus the present functions of the Department of Gas, Water and Electricity, and of Bridges and Docks, as well as those functions newly undertaken.

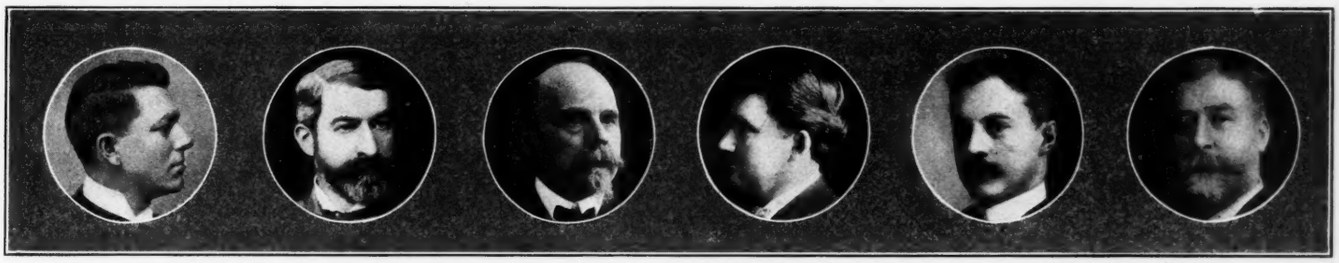
(*d.*) So far as practicable, on precedents of experience here or elsewhere, prescribe duties of several deputies.

(*e.*) Make Department of Public Works dependent upon the Board of Estimate and Apportionment for appropriations and authorization of expenditures to like extent as *e. g.* are borough presidents.

(NOTE.—The inter-relation of these city functions favors handling them by a single department, and militates against distribution among too numerous bureaus—though the fact that they would be controlled in a single interest—that of the city—would largely remedy present evils and permit needed correlation.)

Above is intended to suggest a practical rather than perfect system, and leaves other less active services to remain as now; though in this respect our charter is faulty—markets belonging more naturally to the borough presidents, and express messenger, stage, telephone and other services being wholly unprovided for.

But once having adopted a general system with respect to the services above provided for, inclusion of others, or re-distribution of official functions may be left to experience.



From left to right: Hon. George B. McClellan, Mayor (Photo by Rockwood); Hon. Ed. M. Grout, Comptroller (Photo by Rockwood); Hon. F. V. Fornes, Pres. Boro. of Manhattan (Photo by Gessford); Hon. Martin W. Littleton, Pres. Boro. of Brooklyn (Dampf photo); Hon. George Cromwell, Pres. Boro. of Richmond; Hon. Louis Haffen, Pres. Boro. of the Bronx.

GREATER NEW YORK'S NEW OFFICIALS

THE first of the year sees a change in the administration of the affairs of Greater New York, when Mayor George B. McClellan and the other newly elected and appointed officials take up the reins of government. The new administration will be different from the old, inasmuch as Tammany is now in the ascendent, while the last party in power was a fusion of factions outside of the former organization. Which government will be the better remains to be seen.

At the beginning of the past Low administration in New York it was predicted by many, including ourselves, that a model administration was about to be given the Greater City; a business administration in every sense of the word. Two years have shown that Mr. Low fell far short of all that was predicted for him. There can be no doubt about Mr. Low's honesty of purpose, but his methods have not met with the same approbation, and some of the personal qualities which were assigned to him by District Attorney Jerome before his re-nomination last fall are, no doubt, largely responsible for many of his shortcomings. Mr. Low's disposition was negative, while it needed a positive character to make the success that was looked for. It is to the heads of departments that must be given most of the credit for the good work of the past two years. Mr. Low was fortunate in choosing such men as Dr. Woodbury of the Street Cleaning Department, Homer Folks of the Department of Charities, Dr. Lederle of the Health Department, and Robert de Forest of the Tenement House Department. He was correspondingly unfortunate in placing in similar positions men like Fire Commissioner Thomas Sturgis and Police Commissioner Partridge. Perhaps the latter department has caused more complaint on the part of citizens because of the large part the said department plays in the daily life of the people. There have been many glaring instances of mismanagement on the part of the Commissioners of Police which have lived a long time in the memory of the citizens.

The charges against the late Chief of the Fire Department, E. F. Croker and his trial, which resulted in his dismissal, caused considerable comment and subjected the Commissioner to a large amount of adverse criticism, but, if the end will justify the means, the change in the active head of the department has been not only justified but also has created a great change for the better. The elevation of Chief Purroy brought harmony and order in the department and restored the discipline and good feeling between officers and men that are so essential to its success.

The recent election has caused a change in the character of the city administration, although some of the old officials will continue in office for a further term of two years. Thus, the Presidents of the Boroughs of Queens, Richmond and the Bronx will guide the ship of state in their respective districts for another term. The city's finances will be under the management of Comptroller Grout, over whose renomination there was so much ado. President Fornes of the Board of Aldermen, will take up new work as President of Manhattan Borough, succeeding Hon. Jacob A. Cantor, who would not permit his name to be used again. President George Cromwell of the Borough of Richmond, stands in a unique position among the other officials, inasmuch as he is the only one of the old officials, renominated by the Fusion forces, who succeeded in securing a re-election.

At this early date it is wise not to make any prophesies concerning the new officials. A year at least should be given them to prove what they can do, although long before that time it will be possible to judge of their probable ability in conducting the affairs of office.

The new Corporation Counsel was the first appointment named by Mayor McClellan, and is Mr. John J. Delany. Hon. Patrick Keenan was named for City Chamberlain and Hon. Francis J. Lantry for Commissioner of Corrections. Both of these officials held these positions under the Van Wyck administration. Mr. Nicholas J. Hayes will be the new Fire Commissioner to succeed Commissioner Sturgis. He has been Assistant City Clerk since January, 1898, and his place there will be filled by City Clerk Skully. Hon. T. C. T. Crain will succeed Commissioner Robert DeForest as Tenement House Commissioner. He was City Chamberlain under Mayors Gilroy and Grant, and leaves the position of Deputy Attorney-General to become Tenement House Commissioner.

Hon. William McAdoo has received the appointment of Police Commissioner, Mr. Maurice Featherstone that of Commissioner of Docks and Ferries, and Messrs. John C. Hertle and William Harmon Black Commissionerships of Accounts. Mr. McAdoo was Assistant Secretary of the Navy under Cleveland and is a lawyer. Mr. Featherstone was a machinist in the Fire Department and is a Tammany district leader.

It was stated on good authority that, during the next two years Tammany was going to give New York a good administration to show that the "Tiger" had really reformed. It was also stated that the district leaders were not to figure as heads of departments, but these appointments have given the lie to that theory, inasmuch as four of the appointments named above are district leaders. It is to be hoped that there is more truth in the first statement than there has proved to be in the second. In the Departments of Health and Street Cleaning fine records have been made by the past administration and Tammany will have to do far better than she ever has done before to outdo them. These, with those of Police and Fire, are the Departments which come closest to the daily life of the citizens and great advances were made in them under the late heads. Whether the new commissioners can equal the records of their predecessors remains to be seen. The best way will be to follow the example of Bre'r Rabbit and say nothing until we have some facts on which to form opinions. Commenting on the above appointments, the New York *Times* took a different view, when it said: "Those optimistic souls, who cherished the hope that in electing a Mayor bearing an honored name and personally respectable Tammany had evinced a change of heart, may now contemplate the wreck and ruin of their hopes. Of the appointees whose names have been announced by the Mayor-elect, one was the manager of his campaign, three are Tammany district leaders, and two held office under Mayor Van Wyck. After this frank exhibition of the Tammany spirit, after this proof that the clutch of the controlling hand is upon the new Mayor, it may be said that a man who still believes that Mr. McClellan will be his own master, and will perform the duties of his office with regard only to the public welfare, would believe anything."

THE ASPHALT TRUST TURNED DOWN

The Story of a Long-Fought Legal Battle—A Victory Which Benefits All American Cities—What the New York *Tribune* Thinks

By Walter J. Somers, C. E.

One of the greatest tasks undertaken by the Low Administration to reform the affairs of the city of New York, was in connection with paving matters. The result of the hard-fought battle against the Asphalt Trust must be gratifying to the Mayor and his co-workers in the Board of Estimate and Apportionment. In this connection I quote from the New York *Tribune* of Sunday, December 13:

Blow for the Asphalt Trust

"The Asphalt Trust has received a severe blow by the award made by the Park Department for the Pavement of West Seventy-second street. The Trust has made a big fight to keep away competitors, going so far as to obtain an injunction against the Warren Brothers Company, makers of the bitulithic pavement. Strong protests have been made against the use of sheet asphalt, owing to its slippery condition in wet weather, by the Road Drivers' Association, The New York and Chicago Association, automobile and cyclists organizations and other interests, and the Park Department deferred the matter to the Board of Estimate and Apportionment, and asked permission to award the contract to the Warren Company after the courts had vacated the injunction obtained by the Trust. The Trust then obtained a temporary stay, pending an appeal, but this was vacated, and the contract has been awarded to the Warren Company, at $2.40 a square yard, exclusive of foundations, but including a five-year guaranty. This price is higher than the bid for sheet asphalt, but lower than that of block asphalt.

"The same organizations which protested against the use of sheet asphalt in Seventy-second street, recommended that the bitulithic pavement be placed in upper Seventh avenue, and the authorities were satisfied of the merits of the pavement offered, but here the Asphalt Trust raised the objection that the process was patented, and taking advantage of a clause in the Greater New York charter relating to the use of patented articles by the city, obtained an injunction preventing the city from using it. This clause has never been interpreted by the courts, and the Appellate Division decided the case practically against the Trust, but, owing to the delay occasioned by the litigation, the authorities decided to make temporary repairs to this boulevard, and the contract was not let.

"The victory of the new pavement in the Seventy-second street case practically puts an end to the expensive conditions which prevailed when the Barber concern, which is the head of the Trust, was without competition in spreading asphalt over New York's streets, and there is a strong probability that the pavement in Seventh avenue will be laid under new conditions."

This but briefly summarizes the result of two years' litigation on the part of Mayor Low's administration, with the Asphalt Trust, and the records in the various proceedings involve something over six hundred pages.

Rotten Asphalt Roasted by Officials

When Mayor Low took his seat, many asphalt pavements in New York were in a dilapidated condition. The commissioners of public works and the presidents of the various boroughs found it impossible to require the asphalt companies to maintain their streets, which were still under guaranty, in satisfactory condition, and New York daily papers have been filled with criticisms, and with the expressions of public indignation aroused by the methods of the Trust.

Petitions for paving aggregating some 750,000 square yards, and including such prominent boulevards as Seventh, St. Nicholas and Lenox avenues, were presented, asking that the streets be paved with the bitulithic pavement, a patented pavement controlled by Warren Brothers Company. Most of these petitions were obtained and presented by the property owners or the taxpayers' associations, and were further endorsed by official reports and the appearance before the proper authorities of numerous associations, such as The Road Drivers, The Automobilists, Truck Owners, Associated Cycle Clubs, The League of American Wheelmen, etc. The result of these strong endorsements induced the President of the Borough of Manhattan to send the Engineer of Highways to investigate the pavement where it had been laid in other cities, and it finally resulted in the Borough Engineers and Commissioner of Public Works of other boroughs, making similar investigations through their engineers, and the official record of the proceedings is one of the strongest endorsements of merit which any pavement has ever received.

After these investigations there came the opinion of the Corporation Counsel, suggesting two methods by which a patented pavement could be legally advertised for in the city of New York, in view of the following clause in the charter:

"Except for repairs, no patented pavement shall be laid, and no patented article shall be advertised for, contracted for or purchased, except under such circumstances that there can be a fair and reasonable opportunity for competition, the conditions to secure which shall be prescribed by the Board of Estimate and Apportionment."

SEVENTY-SECOND STREET, LOOKING TOWARD CENTRAL PARK—TO BE PAVED WITH BITULITHIC PAVEMENT

Bitulithic Unanimously Adopted

The Board of Estimate and Apportionment, which is composed of Mayor Low, the Comptroller and the President of each of the Boroughs, together with the President of the Board of Aldermen, unanimously adopted specifications for the bitulithic pavement.

The next opposi-

tion then came from The Barber Asphalt Paving Company appearing before the Board of Estimate and Apportionment, having expressed a willingness to infringe the Warren patents, and claiming they would lay the same pavement for much less than cost of construction. The Board of Estimate and Apportionment were not allured by the Trust's offer, and refused to consider it in this form of pavement. Then The Barber Asphalt Paving Company, acting as a taxpayer, undertook to enjoin the city from contracting for the pavement on Seventh avenue, and the city has been fighting for its rights ever since, and has, finally, after passing through the various courts, been enabled to award contracts on Seventy-second street.

SEVENTY-SECOND STREET, NEW YORK, LOOKING TOWARD THE HUDSON RIVER—TO BE PAVED WITH BITULITHIC PAVEMENT

It is to the credit of the bitulithic pavement that it should have had the unanimous endorsement of such a strong administration as the Low administration. Even in the case of Seventy-second street, The Barber Asphalt Paving Company has been given three hearings, and it has not been able to present a case which the courts would sustain. All the technicalities of the law have been resorted to. The cities of the United States which have been accustomed to dealing with the Asphalt Trust are familiar with its tactics. The Trust is a hard loser, and never has failed to place every possible impediment in the way of administrations which did not do its bidding.

Under the methods adopted in the city of New York for laying patented pavement on Seventy-second street, bids were invited for sheet asphalt as well as for bitulithic, and the asphalt people submitted the ridiculous bid of $1.17 per square yard for the work complete, as against the bitulithic bid of $2.40 per square yard. Both included five-year guarantees, but the cost of excavation and foundation was extra.

The Trust Uses Same Tactics Elsewhere

This Trust tactic cutting and slashing for the purpose of annihilating legitimate competition, is well understood by the American public, and it is to the credit of the Low administration that it was not bulldozed into accepting a bid for asphalt at $1.17 as against a bid for bitulithic at $2.40, for it was clear that the asphalt pavement at any price was not suitable for the conditions expected of a pavement on a residence driving boulevard in New York, and it was also clear that the bid was made for the purpose of destroying competition, rather than in good faith.

It is not probable that a greater difference would ever exist in the future, and inasmuch as the legality of the award under these conditions has been sustained by the courts, it is fair to assume that it will be difficult for the Asphalt Trust to further hamper the construction of pavement other than asphalt in this city. It is a noteworthy fact, too, that in passing on this matter the Board of Estimate and Apportionment has acted unanimously, and that there has been no difference of opinion on the part of the New York officials.

Similar tactics to those practiced in New York are being practiced in other cities, but I know of no city or of any administration that has stood the attack and made the fight more manfully than have Mayor Low and his administration.

The Corporation Counsel's office has been called to do a tremendous amount of extra work on account of the greed of the Trust, and public improvement in New York City has been delayed to no little extent, but now the way is clear to proceed with paving without the consent of the Trust.

It may seem strange, but the article regulating the use of patented pavement in the city of New York has been in the various charters for more than forty years, and this is the first time it has ever been adjudicated, and this adjudication throws the way open to the use of the most modern pavements, whether patented or not.

Trust Fights All Kinds of Pavement

The obstructive tactics of the Asphalt Trust in New York city have not been confined exclusively to opposition to the bitulithic pavement. It also endeavored, but unsuccessfully, by legal process, to prevent the laying of asphalt block pavement, on the ground that it was a patented pavement. The same tactics have been taken in other cities, for instance, in St. Louis The Barber Asphalt Paving Company, through its agent, enjoined the city from laying the bitulithic pavement, but the courts vacated the injunction and the city of St. Louis has this year laid about five miles of bitulithic pavement on its leading boulevards.

But it is unfortunate that the Asphalt Trust has been successful in its fights against brick paving in Cleveland and Des Moines, in which cities it was practically able to kill the industries by taking contracts for brick pavement at unprofitable prices. It is safe to say that if every city would permit the Asphalt Trust to annihilate competitors by doing all classes of work at a loss rather than permit the development of other forms of pavement, it would be enabled to build up the most gigantic trust in street paving which has ever been known, and would then be able to return to the prices of $3.50 to $7.40 which were paid in New York for asphalt paving a few years ago.

One of the first acts of Mayor Low's administration was to secure improved pavements for the city of New York. One if its final crowning acts is the favorable culmination of a stubbornly fought legal battle between the Asphalt Trust and the city, under which the Asphalt Trust sought to prevent the city from laying any character of pavement which its officials might feel to be to the best interests of the city. The Low administration is to be congratulated on the outcome, and on its persistency in standing out against a powerful trust for the rights of the city.

The engineer to Comptroller Grout, Mr. Eugene E. McLean, investigated the bitulithic pavement in other cities and reported that, "The bitulithic pavement combines most of the advantages of the macadam in giving a firm footing for the horse, and does away with the smooth surface of sheet asphalt, dangerous in slippery weather. The pavement has the general characteristics and appearance of the macadam, but is so bound together that it does not wash or rut in heavy rains, thereby doing away with the heavy cost of maintenance required for the macadam. The pavement is not dusty in dry weather, as the fine top dressing is held in place by the binder, eliminating the constant sprinkling required for the macadam."

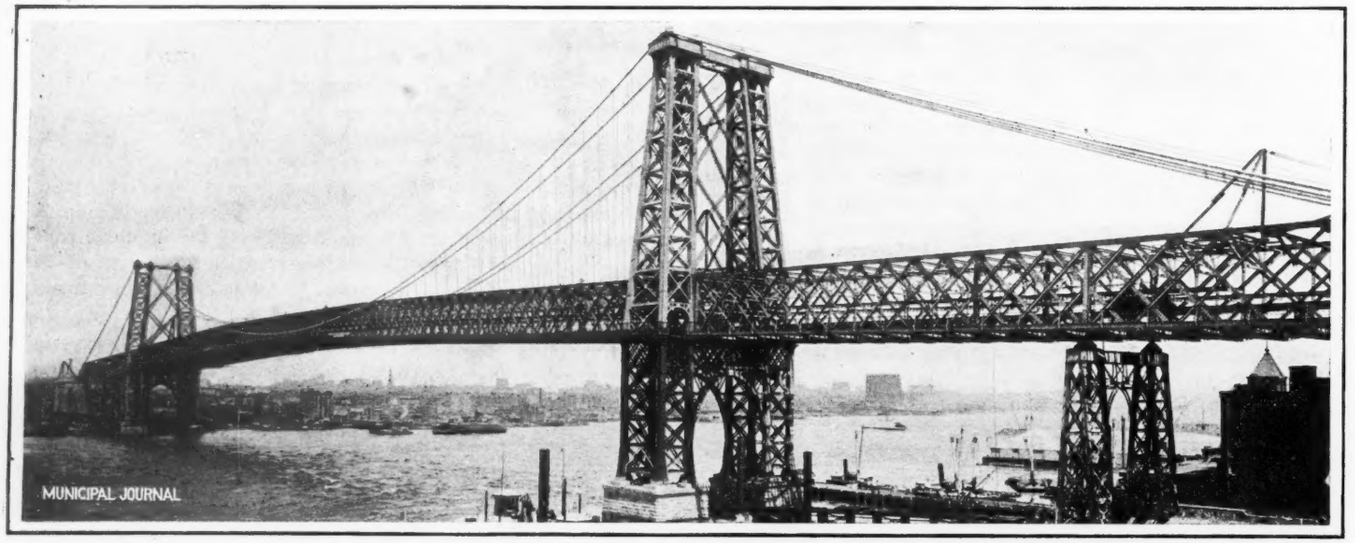
OPENING OF THE NEW SUSPENSION BRIDGE

Festivities Mark the Event - Second of the Four East River Bridges—Cost New York $20,000,000—Description of the Structure

ON the afternoon of December 19, the new Williamsburg Bridge across the East River, between the Borough of Manhattan and the Williamsburg section of Brooklyn, New York, was formally opened, although the structure is not yet entirely completed. The event was made an occasion for land and water parades and speechmaking on the part of the officials of both boroughs. Mayor Low and Manhattan officials were escorted from the City Hall to the New York end of the bridge by a troup of cavalry and were met in the center of the structure by officials from the Brooklyn side who had come under escort of a large parade that had passed through the Williamsburg section of the city. At night the bridge was illuminated with electric lights and beautiful fireworks were enjoyed by thousands. After the speechmaking was over, the officials and other prominent persons were driven to one of Brooklyn's clubs where a luncheon was served and a general reception held. An incident of the reception was the cordiality shown to Chief Engineer L. L. Buck, who designed the bridge and whom Commissioner of Bridges Lindenthal had decided to remove.

THREE NEW BRIDGES FOR NEW YORK

The Williamsburg Bridge is the second structure to span the East River and connect more closely the boroughs of Manhattan and Brooklyn. The first bridge is known as the Brooklyn Bridge and was one of the marvels of the engineering profession when finished. It has been the connecting link between the two sections and has proved inadequate for the enormous amount of traffic which it has had to carry since the great increase in the population of the city. The new bridge will take some of the burden off the old bridge and will prove an outlet from the northern section of Brooklyn and Long Island City to Manhattan, but these two bridges will not be able to materially relieve the crowding during the rush hours and two others have been started. Bridge No. 3 was authorized in January, 1900, the cost being estimated at $15,833,600, of which amount $9,522,000 was for structure. This bridge is to be a suspension bridge like that of the Williamsburg Bridge, while Bridge No. 4 will be of the cantilever type. This will connect Manhattan with Long Island City and will have towers on Blackwell's Island, which is in the river between the two cities. The cost of this structure was placed at $12,548,500, of which $9,400,000 was for the bridge itself. Mayor Van Wyck approved of this bridge in November, 1900. At present, both of these bridges are under way, but the towers have not yet been erected and it will be some years before the structures are completed. It is confidently expected that these four bridges, with the tunnels underneath the river, will make travel between the two boroughs much easier than it is at present.



GENERAL VIEW OF WILLIAMSBURG BRIDGE FROM BROOKLYN SIDE

DESCRIPTION OF WILLIAMSBURG BRIDGE

The Williamsburg Bridge, which is the largest span suspension bridge of its kind in the world, was first proposed in 1892. The development of Brooklyn, especially in the Eastern District, and the inadequate transit facilities across the East River brought it about.

The East River Bridge Company first got the franchise for building the bridge, but for lack of funds could not carry it through. The matter then lay dormant for three years, when, mainly through the efforts of Mayor Schieren of Brooklyn, the Legislature passed the East River Bridge bill. A commission was appointed and it was decided that the old cities of New York and Brooklyn should pay the East River Bridge Company $200,000 for the franchise.

When this had been done the site was selected, the plans made and the first actual work started on the Manhattan tower of the bridge on Oct. 28, 1896.

The bridge spans the East River from Delancey street, Manhattan, to South Fifth and South Sixth streets, Brooklyn. Its total length from the street grade in Manhattan to the street grade in Brooklyn is 7,200 feet. The width of the bridge is 118 feet. In carrying capacity it exceeds any other bridge in the world. It provides for two eighteen foot roadways, two footpaths, four street railway tracks, two elevated railway tracks and two bicycle paths.

The length of the main span is 1,600 feet, or just 5 feet 6 inches more than that of the Brooklyn Bridge. The new bridge is 7,264 feet long, or about 1,275 feet more than the Brooklyn Bridge. The approach at the Manhattan end is 1,562 feet, and at the Brooklyn end, 971 feet. The Manhattan entrance to the bridge is at Grand and Willett streets and the Brooklyn entrance at Roebling street.

MASSIVE FOUNDATIONS FOR TOWERS

Naturally the building of the foundation is the most important part of a 1,600-foot suspension bridge. The foundations of the new structure consist of timber caissons filled in with concrete. While similarly constructed, the dimensions of the caissons are not the same, because of the varying depth of the rock below the river surface. Stiffening girders of reavy steel were used on the caissons on the Manhattan side, but this was not necessary at the Brooklyn end,

Courtesy, *Engineering News.*

NEW BRIDGE UNDER CONSTRUCTION, SHOWING FOOT PATHS

where the caissons were carried down deeper than on the Manhattan side.

The anchorages are massive structures. The one on the Manhattan side rests on 3,500 piles, while the one on the Brooklyn side is built on natural sand. In each, 1,600 tons of cable anchor steel were used, in addition to 1,500 feet of timber, 10,000 cubic yards of cement and 44,597 cubic yards of masonry. One anchorage weighs 125,000 tons.

There are four cables, their total pull being 20,250 tons. Each cable has thirty-seven strands, each containing 281 wires, so there are in the four cables 41,588 wires. Great care had to be taken to protect the wires from oxidation.

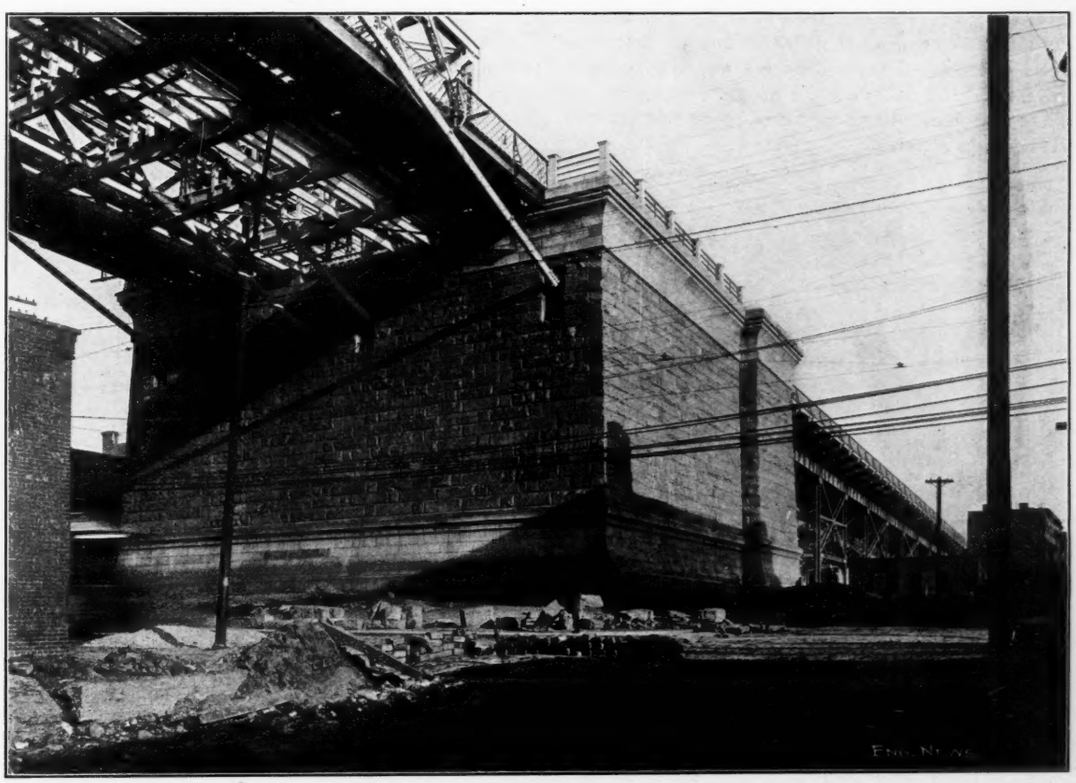
The steel towers rise 332 feet above high water. They will be increased in height by twenty feet when the ornamental caps to cover the cable saddles are put on.

A distinctive feature of the new bridge, leaving aside its great size, is the amount of steel used in its construction. The two towers contain 13,048 tons of steel. The girders in the Brooklyn approach weigh 6,085 tons and in the Manhattan approach 10,550 tons. There are 5,000 tons of steel in the cable and other fixtures, and the central span contains 7,772 tons of steel. Taking into consideration steel used in other parts of the structure, the total amount in the bridge is about 40,000 tons.

The minimum height of the structure above mean high water at the pierhead line is 122 feet. The minimum height above mean high water for 200 feet on each side of the centre of the main span is 135 feet. The height of the masonry in the tower foundations above high water is twenty-three feet.

About 8,000 cubic feet of timber, 10,000 cubic yards of concrete and 45,000 cubic yards of stone masonry were used in the construction of the bridge. Taking into consideration the cost of the land and the construction of the bridge, the outlay will be about $20,000,000. The New York tower foundation, cost $373,463; Brooklyn tower foundation, $485,082; the anchorages, $1,570,000; steel towers and shore spans, $1,222,726; cables and suspenders, $1,398,000; approaches, $2,411,000, and the main span's suspended system, $1,123,400.

The bridge was designed by Leffert L. Buck, who has had great experience in bridge building. He spent a number of years in railroad and bridge building in Peru, and returned to this country in 1877. Then he supervised the reconstruction of the original railroad bridge at Niagara Falls, finally building the new structure that was put up in 1896. He built two bridges across the gorge of the Genesee River in Rochester.



Courtesy, *Engineering News.*

BROOKLYN ANCHORAGE OF NEW BRIDGE

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Water Works Statistics

An interesting compilation of Water Works Statistics for the year 1902, relating to forty-four American cities, mostly in the New England States, was recently published in the *Journal of the New England Water Works Association;* and on examination of the data there presented, a number of cases will be found where most of the service taps are metered, while there is a great discrepancy between the total quantity of water delivered and the aggregate of the meter readings. The following are the most conspicuous instances of this kind, the cities being arranged according to the percentage of service taps metered.

City.	Estimated Number of Inhabitants.	Estimated Number of Water Consumers.	Average Consumption in Gallons per Day. Per Inhabitant.	Average Consumption in Gallons per Day. Per Consumer.	Percentage of Service Taps Metered.	Percentage of Total Supply Metered.	Mode of Supply.
1. Ware, Mass.	8,263	7,690	41	44	100	60	Pumping
2. Wellesly, Mass.	5,240	5,147	49	49	100	52	"
3. Yonkers, N. Y.	52,000	51,000	87	89	98	53	"
4. Madison, Wis	20,000	18,792	63	67	95	30	"
5. Winchendon, Mass.	5,300	2,576	19	38	95	37	"
6. Brockton, Mass.	44,500	37,800	31	36	90	54	"
7. Woonsocket, R. I.	34,974	34,474	28	29	87	77	"
8. Newton, Mass.	36,400	35,400	53	54	86	62	"
9. Providence, R. I.	198,400	198,400	58	58	84	60	"
10. Lawrence, Mass.	68,500	65,000	50	53	83	45	"
11. Oberlin, O.	4,800	3,000	28	45	75	37	"
12. Burlington, Vt.	19,200	18,600	41	43	73	54	"

No attempt is made in the published statistics to account for the discrepancy mentioned, and the reader is therefore left to draw his own inference. This is not fair either to the community, the superintendent, or the student of water works matters, as a wrong interpretation of the anomally may lead to various undesirable results. In each case of this kind, an explanation should be given by the official in charge of the works, and this should be indicated plainly in every compilation, in order to avoid dissemination of error and make the statistical work more valuable to all concerned.

Thus, in the cases of Ware and Wellesley, where every service tap is said to be metered and the aggregate of the meter readings is only 60 and 52 per cent. respectively, of the total quantity of water claimed to be delivered, the reader is compelled to assume either, that the meters do not give a correct registration, or that the slip of the pumping engines is grossly excessive, or that there is an undue amount of leakage from the distributing pipe system. A loss of this magnitude should not be passed over lightly by those in charge of the water works, and if the source of the loss has been definitely ascertained, it is worthy of the most extensive publication.

Taking up the three sources mentioned, it may be said that in view of the many severe tests that have been made with water meters during the past twenty years, the large loss referred to cannot justly be ascribed to these measuring devices, as their error of registration is insignificant when kept under careful supervision. General dishonesty on the part of the consumer by skillful manipulation of the meter dials must also be excluded, as such instances are comparatively rare, and are usually detected in the course of a few months, by a vigilant superintendent.

The amount of slip or loss of action in a pumping engine depends upon various elements, such as wear, packing, speed, condition of valves, etc. Makers of high-class pumping machinery readily admit a loss of 4 to 10 per cent. in well-maintained plants, but when a loss of 15 to 25 per cent. occurs, they are unanimous in attributing it to gross carelessness of the attendants. In the cases mentioned, the great discrepancy between the alleged delivery and the registration of the meters, clearly puts the pumping plant on the defensive, and if this is not in fault, the statistics should manifestly embrace a statement of the slip as determined by careful and frequent experiment.

The third source of loss is the unavoidable leakage from the system of distributing pipes and its adjuncts, such as stop-valves and hydrants. As usually constructed with cast iron pipes, the distributing system has about five hundred lead joints per mile, and in consequence of small disturbances by settlement and changes of length, due to seasonal variations of temperature, a slight leakage at many of these joints must be expected. By actual measurement, the escape of only one drop of water per second, amounts to about two gallons per day; and as there may easily be more than 100 defective joints in every mile of pipe, many of which have a much larger loss than one drop per second, also because of unnoticed leakage at numerous taps, stop-valves and hydrants, the total loss from the pipe system may readily aggregate 2,000 to 5,000 gallons per mile per day, and it may even be two or three times greater before the water will manifest itself on the surface of the street or ground.

In towns of large area and small population, the length of distributing pipe per consumer is obviously much greater than in densely populated cities, and it will also be found that the average diameter of the pipe system is somewhat larger in the former than in the latter. Furthermore, the amount of leakage from a lead joint may be considered as being proportional to its length, or to the diameter of the pipe; hence it follows that in a small town the leakage from the pipe system should be somewhat more per consumer than in a large city.

The excellent compilation referred to above gives the total mileage of the distributing pipe, with range of sizes, but not the average diameter, and to find the latter for any city, recourse must be had to departmental reports. This is a somewhat tedious matter, and therefore comparisons and estimates of leakage would be greatly facilitated if the statistics contained the statements indicated.

Applying a fair average rate of leakage in the two cases cited above, we will find that the quantity thus computed will account for only a small part of the difference between the stated delivery and the meter registration; and even by adding liberal allowances for error of such registration and pump slip, a balance cannot be obtained. Similar results are found in the cases of Yonkers, Madison, Winchendon and Brockton, where 98 to 90 per cent. of the taps are metered and the total meter registration ranges from 30 to 54 per cent. of the delivery.

It cannot be assumed that the officers in charge of these water works are not fully acquainted with the foregoing general facts, and that they have not given careful thought to the subject, as the discrepancies have been known to exist for several years. Some reasonable explanation of the cause must therefore be available at

the present time, and should find a place in new statistical tables. Busy water-works officials encounter so many perplexities in their own daily work, that they will surely welcome plausible solutions of the difficulties of others.

In the case of the remaining six cities named in the above table, the percentage of taps metered ranges from 87 to 73, and the aggregate meter registration ranges from 77 to 37 per cent. of the supply. The discrepancies are here more easily explained by assuming that large quantities of water are consumed or wasted in unmetered dwellings, public buildings and sewer-flushing operations. This assumption, however, at once leads to the charge of inconsistency on part of the water-works authorities in not applying meters also to the small remainder of the taps, and thus greatly reducing the daily consumption.

There is no sound reason why all public buildings should not be metered, nor is it a very burdensome matter to the officers in charge of the fire, sewer and street departments of a city to keep a reasonably correct record of the time during which hose streams from fire hydrants were kept running for the various purposes indicated. With a knowledge of the average water pressure and the aggregate duration of such streams, the approximate discharge may be quickly computed, and a means will thus be secured for concentrating efforts to prevent the waste of water in a few definite directions. Statistics of this kind are of immense value, and it is hoped that energetic water-works superintendents will make strenuous efforts to secure them for publication in their annual reports, so that the data can be incorporated in future compilations.

E. KUICHLING, *Engineering Editor.*

Brick for Pavement

MAYOR OLNEY wishes to make a trial of vitrified brick pavement, and he very wisely suggests that a sample block be first laid so that its character and durability be thoroughly tested. Vitrified brick for such purposes is not a new thing and can hardly be said to be in the experimental stage, but it must be remembered that conditions differ and what may be suitable in one place may be wholly unsuitable in another. Consequently the Mayor's suggestion that the brick pavement be thoroughly tried before being adopted is a good one.

But after all, it is the care more than character that makes a good pavement. Almost any of the accepted materials, if properly laid and properly cared for, make good, permanent pavements, and all of them are ruined by neglect. No street will maintain itself in good order. As soon as a pavement is laid it begins to deteriorate, and that city is the wisest which never allows this deterioration to reach the point of destruction. Brick will undoubtedly make a good street in Oakland if it be properly laid and taken care of, but brick will be as poor as any other material if it be allowed to go to rack and ruin.—*Oakland Inquirer.*

Asphalt in Business Streets

IN a hearing given by the Borough President of Manhattan on a petition of property owners and tenants for the asphalting of Park Row, the consensus of opinion was emphatically against the asphalting of that or any street in the business district of New York. The petition was favored by those whose interests were represented by the owners or occupants of office buildings because asphalted streets are pleasanter for pedestrians than streets otherwise paved. This is not a very important aspect of the question, since street surfaces between curbs are not commonly chosen with reference to the convenience of those who may choose to walk on them; but with Nassau street in mind, and the obvious inadequacy of its very narrow sidewalks to accommodate the multitudes using it in going to and from the Brooklyn Bridge and the City Hall elevated railroad terminal, it it not impossible that it will presently become necessary to close it to vehicles at certain hours in order that pedestrians may have both the sidewalks and the roadway.

The opposition to the Park Row petition was from those identified with the trucking industry and was unanimous and emphatic. The President of the New York Truck Owners' Association took the ground that it would be a crime against the public interest to asphalt Park Row. It was pointed out that owing to the inability of asphalt to give a proper foothold for horses, streets thus paved are shunned by business wagons, and that traffic seeks streets in which the danger to the horses is less. The arguments on this side, while ex parte, were extremely strong and impressive, but they failed of being conclusive by reason of the fact that they did not concede the advantages of asphalt from some points of view while emphasizing its disadvantages from others.

* * *

From every other point of view than the interests of the horse owner the theoretical advantages of asphalt for street surfacing are conspicuous, and they are largely attained in practice when the material is good and the work honest. But the horse, as costly for business as it is proverbially vain for safety, is not yet extinct, and prematurely to establish street conditions which are impossible for horses would be inimical to the public interest. At the same time the popular demand for the clean, noiseless, non-absorbent surface which asphalt gives is irresistible, and while the truck owners may discourage the asphalting of certain streets, they cannot wholly, nor for long, resist the progress of street improvement. This suggests the advisability of an intelligent effort to retain the advantages of asphalt for street surfaces while correcting its disadvantages. A slippery pavement which does not give horses a foothold is not a perfect pavement, and to correct this conspicuous defect in asphalt is probably not a mechanical impossibility. The subject of asphalt streets in the business district is one of great public interest, and neither side of the argument has a monopoly of truth or intelligence. —*New York Times,* Dec. 26, 1903.

The Asphalt Assessment

THE story of a receiver's assessment of $24,000,000 furnishes an excellent opportunity for a harrowing tale of wrecked fortunes and ruined lives. But there need be neither sympathy for those Asphalt Trust people upon whom this fearful blow is supposed to fall nor anxiety on their account. With the possible exception of one or two of the less prominent offenders in this case, all have hunted cover long ago. The receiver's club is made of pasteboard, and it falls only on imaginary shoulders.

In all the long history of financial bubbles, few have been more skilfully engineered than was this same asphalt operation. Its promoters picked up properties of little value; then, as one organization, sold them to themselves, as another organization, at vastly inflated prices. Then they piled on more price and unloaded on the confiding public. Then came market manipulation and reorganization. For the lay mind the whole affair is a financial jungle, with victims at every turn. But the promoters are not numbered among the victims, nor are they in any likelihood of being counted among the casualties.

The Asphalt Company of America was incorporated under the laws of New Jersey in July, 1899. Its capital was $30,000,000, in 600,000 shares of $50 each. Upon organization $30,000,000 in 5 per cent. gold certificates was issued, $10 per share was paid up on the stock, and the unpaid $24,000,000 is the basis of the present alleged indebtedness. In September, 1900, another rainbow organization proposed the acquisition of the original trust, and the National Asphalt Company was the offspring of the deal. Gen. Francis V. Greene became president of this organization in February, 1901. The directorate included a number of gentlemen of high standing in financial circles.

At that time the Asphalt Company of America lost its identity as a commercial organization. That, however, is about the only really tangible feature in the proceedings. Just where financial responsibility for the unpaid stock went in as much of a mystery as the location of the tomb of Moses: "No man knoweth it unto this day." Nominally, responsibility passed to the new company. The $30,000,000 of stock in the Asphalt Company of America was exchanged for bonds in the National. Within a year the National collapsed. Again there was a reorganization, and all except a few comparatively small holders signed a ten-year iron-clad and copper-riveted

release of all rights and claims, and by so doing placed themselves and their interests absolutely and irrevocably in the hands of the manipulators whose conduct had let them into the difficulty.

The receiver's suit for recovery of the unpaid $40 per share in the Asphalt Company of America is doubtless a necessity in the proceedings for a settlement, but it is entirely safe to say that the promoters and manipulators of the organization are in no immediate danger of either bankruptcy or beggary as a result of it.—*New York Sun.*

The American Road Makers

Last year, this influential good roads organization met at Detroit (Mich.) in connection with an International Conference, when there were representatives from the far West, the great Southwest, the South, the East and the Middle West. It is opportune that the next meeting is to be held at Hartford (Conn.), in the heart of the section where the good roads agitation had its beginnings. New Jersey, Connecticut, Massachusetts and New York are the four shining examples and recognized leaders in this great work. Pennsylvania, Michigan and other States have since fallen into line, and the movement is making rapid progress.

Commissioner of Highways MacDonald, of Connecticut, will be the host of the Road Makers this year. He has arranged to have the meeting held jointly with the Connecticut Civil Engineers' Society, its first session being held on the 9th of February, and the 10th and 11th being devoted to the good roads question. President Horatio S. Earle, former State Senator and now Highway Commissioner of Michigan, has authorized Governor Chamberlaine, of Connecticut, to invite the Governors of all the other States and request them to appoint five delegates to represent their States at this important conference on the betterment of highways. Besides these it is expected that President Earle will invite the members of all State good roads associations, through their presidents, and Commissioner MacDonald will have a full attendance from New England, so that this will be the most notable meeting of its kind of the year.

The program is now being arranged and will be announced in full in the February issue. Any one desiring further particulars should address either President Earle, 705 Fourth avenue, Detroit, Mich., or Commissioner of Highways MacDonald, Hartford, Conn.

Empire State Good Roads Meeting

Among State good roads conventions there is none more notable nor resultful than that annually convening at Albany, at the call of State Engineer Bond, and made up of County Supervisors and Highway Commissioners from all over the State. The fifth convention will be held at Albany on the 26th and 27th of this month.

At the convention of 1903 there was a large attendance, fifty-one out of the sixty-one counties of the State being represented. At that time the appropriations made by the several counties throughout the State for their share of the cost of highway improvement largely exceeded the appropriations which had been made by the Legislature, and through lack of sufficient funds the work of construction was not being taken up as rapidly as would otherwise have been the case. For this reason, it was deemed advisable by the convention that some practical method be devised whereby the State could obtain sufficient funds to meet its share of the cost of improvement as rapidly as the counties appropriated their portion. After a full discussion of this matter, a resolution was adopted in favor of an amendment to the Constitution, authorizing the State to issue bonds for the purpose of obtaining funds to be used in the improvement of public highways by State aid.

The proposition to amend the Constitution of the State was favorably considered by the Legislature of 1903, and a concurrent resolution was adopted to that effect, which, if it passes the next Legislature, will be submitted to the people for ratification, and, if it meets with their approval, will then become law.

Many matters of importance will come before this convention and there will be interesting discussions in connection with the meeting that will have a value for and an effect on the general cause of good roads outside of New York State.

EDITORIAL COMMENT

After many delays New York is studying the water paste problem. It has already found that the water meter is an indispensable factor in the prevention of waste. There are few cities or towns where the water meter is not an economic and sanitary necessity.

Superior (Wis.) is rejoicing over a reduction in the net price of gas from $1.75 for lighting and $1.25 for fuel to $1.40 and $1.00 respectively. Not more than $1.00 should be charged for gas for any purpose when it can be manufactured for seventeen cents per thousand cubic feet, as it is in New York. Eighty cents would be a more equitable rate.

Boston will soon have completed an enlargement of its water supply which will equal the demand of its growing population for the next fifty years. New York is on the verge of pressing need for a larger water supply. Like Philadelphia, New York talks of doing great things, places immense sums at the disposal of boodlers, but seldom achieves greatness in forethought or action, as Boston has.

The corporation counsel of Jersey City has been asked by the Water Board of that city to prepare a bill for introduction at the next session of the Legislature, enabling the city to compel telegraph, telephone and street railway companies to remove all overhead wires and place them underground. Several States and many cities have already made this move for public safety. It is high time that every city in the Union should be on this honor roll.

The Philadelphia *North American* remarks that that city now pays three times as much per mile for cleaning its streets as it paid in 1887. That is creditable, but it would be more respectable if twice the present amount were spent and the city kept clean. A large per cent. of Chicago's streets are filthy, but why should Philadelphia follow the bad example? Philadelphia should emulate its own housekeepers and get clean and keep clean, even though it costs three times the present street cleaning appropriation.

The town of Gardner (Mass.) is following the example of other progressive municipalities in endeavoring to break away from the antiquated system of lighting residence streets with arc electric lamps hung from twenty to fifty feet above the street. The single lamp post, not over ten feet high and automatic in its action, is the ideal lamp for street illumination. It not only lights the sidewalk but the road as well. Besides, it is much more economical of the two systems and there are no ugly poles to disfigure the street nor wires to endanger life.

Other cities should take warning from the horrible experience of Butler, Pa., and see to it that their water supplies are in a safe condition. The immediate cause of the epidemic, as stated by George A. Soper, sanitary expert, was the suspension of the mechanical filtration of the water supply. Every precaution is now being taken by local and State authorities to check the epidemic and to prevent its spreading. The time to lock the barn is before the horse is stolen, and the way for every city to prevent a repetition of Butler's experience is to investigate its water supply before the coming of the typhoid plague.

The Municipal Art Society of Baltimore has prepared an amendment to the city charter providing for the appointment of a paving commission of five members—four to be appointed by the Mayor and the City Engineer to be the fifth—to be known as the fifth subdepartment of the Department of Public Improvements. This suggestion is well meant, but it would be detrimental to the best interests of the city to hamper the City Engineer with the untrained and incompetent advice of four men—no matter whom the Mayor might appoint—of inexperience in such matters. It would be much wiser to so amend the charter as to give the City Engineer, acting with the Mayor's cabinet, the power desired for the special commission.

A Reply to Mr. Cabanne

SAN FRANCISCO, Dec. 17, 1903.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

Enclosed please find money order in payment for my subscription for 1904. I have gained much information from your valuable journal that confirms my belief of the advantage to the people of public ownership. I have had my articles reprinted by the press of this city, giving you full credit.

On page 254, of your December number, you publish a letter from a St. Louis correspondent entitled "A Novel Plan for Municipal Betterment." If an attempt were made to carry out his suggestion that representation be divided among certain arbitrary classifications of the community, it would lead to interminable strife. Good government will be possible when the voter is given an opportunity to select as his representative the person who seems to him best. Proportional representation comes nearest to accomplishing this end. Probably its highest development is as now practiced in the election of members of the Australian Parliament, under the Clarke-Hare system. This system was introduced by Mr. Clarke, now Chief Justice of the Tasmanian Supreme Court.

Under proportional representation, if the various divisions of the community mentioned by your correspondent wished to have a representative of their class elected, if they had the full quota of votes, they would succeed. The history of elections in this country proves that the voter seldom votes for a class candidate, but generally strives to elect the man he believes will give him the best government. The wishes of voters are often frustrated by corrupt control; first of political conventions, and later of blocks of votes that give corporation representatives the necessary majority. It is impossible for a voter to know the character of ten, twenty or fifty men whom he may be asked to elect to a council under our present system. He may know but one or two men, and under proportional representation he could give his choices to them. A good man is generally known to such a number of persons as will be sufficient to elect him under this system. The majority of the community, having the larger quota of votes, and desiring honest representation, will get it. Cliques will be destroyed under this system.

EDWARD P. E. TROY.

Personalities

—The Select Council of Pittsburg, Pa., recently lost by death its President, John S. Lambie.

—Mr. George W. Snow has been selected by Mayor-elect Richard P. Morris for City Engineer of Salt Lake City, Utah.

—Hon. Patrick A. Collins was re-elected Mayor of Boston, Mass., by 27,000 plurality, the largest ever received by a candidate for that office.

—Ex-Mayor William Lupton, of Martins Ferry, O., died the first part of December last. He was one of the most prominent men in Eastern Ohio.

—Dr. Charles V. Genoway was elected Health Officer for Spokane, Wash., to succeed Dr. D. C. Newman, whose resignation the Health Board had eccepted.

—Mr. Lute L. Veirs, Councilman and Acting Mayor of Santa Rosa, Cal., recently left the city with some of the city's funds in his possession, besides having committed several forgeries.

—In his message to the Council of Bridgeport, Conn., Mayor Denis Mulvihill recommended immediate action upon his scheme to remodel the city hall. He recommended the sum of $100,000 for the purpose, half of which is to be appropriated this year and the rest the following year.

—The next mayor of Des Moines, Ia., is to receive the sum of $2,500 per year for his services. The present Mayor receives $2,000, but the Council considered that, inasmuch as it was necessary for a mayor to spend at least $500 in gifts, there was little left for the mayor on which to live.

—Mr. W. R. Hill, former Chief Engineer of the New York Aqueduct Commission, and before that Chief Engineer of the Syracuse Water Works, declared in an address to the students of Syracuse University that the city had the best water works system in the United States and perhaps in the world.

—Commissioner Walter D. Greene, of the Buffalo (N. Y.) Health Department, has recommended that a city disinfecting corps be appointed to disinfect all houses in which communicable diseases exist. At present he has school books disinfected each year. He has recommended that all the steam cars should be fumigated.

—Mayor Adolph J. Rodenbeck, of Rochester, N. Y., resigned about a month before his term of office expired in order to accept a judgeship in the State Court of Claims to which he has been appointed. President Hiram E. Edgerton, of the Council, was acting mayor until January 1, when Mayor Cutler took charge.

—Mayor Carter Harrison, of Chicago, has declared that the city would enter into competition with the gas trust and electric lighting companies. He expects that these companies will appeal to the courts, but this is what he invites in order to settle whether the municipal lighting plant has the right to sell its product to private consumers.

—Mayor David Rose, of Milwaukee, Wis., has suggested that the city establish a municipal coal and wood yard from which all the public buildings and the Fire Department could be supplied as well as private parties. The Legislature has given the city the right to deal in fuel and, as the price of coal has been very high, and as it is generally believed that the rates are controlled by a combination, it is the desire of the Mayor and others for the city to enter the field and secure its fuel at moderate prices.

—At the last convention of the American Society of Mechanical Engineers, held in New York, the following officers were elected for the coming year: President, Ambrose Swasey, of Cleveland, Ohio; vice-presidents, O. S. Jacobs, Hoboken, N. J.; M. L. Kolman, St. Louis, Mo.; A. Mattice, Pittsburg, Pa.; treasurer, Congressman-elect William H. Wiley, of Orange, N. J.; secretary, Frederick R. Hutton, of Columbia University; council, George J. Rockwood, of Worcester, Mass.; John W. Lieb, of New York, and W. J. Keep, of Detroit, Mich.

—The elections for mayor in Massachusetts cities resulted as follows: Beverly, Parker F. Davis, no party, re-elected; Brockton, Edward H. Keith, Republican; Chicopee, Charles A. Buckley, Democrat; Everett, Thomas J. Boynton, no party; Fitchburg, Henry O. Sawyer, Citizen; Gloucester, James E. Tolman, Republican, re-elected; Haverhill, Roswell L. Wood, Republican; Holyoke, Arthur P. Chapin, Republican, re-elected; Lawrence, Cornelius F. Lynch, Democrat; Lowell, Charles E. Howe, Republican, re-elected; Lynn, Henry W. Eastman, Republican, re-elected; Malden, Charles L. Dean, Republican, re-elected; Marlboro, F. R. S. Mildon, Democrat; Melrose, Sidney H. Buttrick, Republican, re-elected; New Bedford, Charles S. Ashley, Democrat, re-elected for tenth term; Newton, Alonzo R. Weed, Republican; Northampton, Henry C. Hallett, Republican, re-elected; Pittsfield, Harry D. Sisson, Republican, re-elected; Quincy, Charles M. Bryant, Republican, re-elected; Salem, Joseph N. Peterson, Republican, re-elected; Somerville, Leonard B. Chandler, Republican; Springfield, Everett E. Stone, Republican, re-elected; Taunton, Richard E. Warner, Republican, re-elected; Waltham, John E. Harvey, Republican; Woburn, John P. Feeney, Democrat, re-elected; Worcester, Walter H. Blodget, Republican.

Water Rates Not Taxes

A RECENT decision of the Supreme Court of Minnesota has upheld the rules that the Board of Water and Light Commissioners of Duluth have made for the use of water in that city. It was held that water rates were not taxes within the meaning of the constitutional provision requiring a uniformity of taxation, but are merely the price paid for water, and the relation is one of contract between the city and consumer. The case in point was the refusal of the city to place a consumer on the flat rate after he had been using a meter which was first installed when the water supply was owned by a private company. The Court held that the rates were not arbitrary or unreasonable, for the water was furnished as nearly as possible at cost and the flat rates were made as nearly uniform as could be to the rates by meter.

NEWS AND PRACTICE AMONG THE CITIES

Gas, Ninety Cents in Duluth—London's New Municipal Lodging House—City Departments Should Pay for Water—Want to Change Ohio's Municipal Code

Ninety-Cent Gas for Duluth

WHEN Superintendent L. N. Case assumed management of the Gas Department of Duluth, the gas rate was $1.90 per 1,000 cubic feet, and the receipts from the gas consumption did not pay the expenses. His first proposition was to lower the price to $1.50 on the plea that three consumers at this rate were better than one at $1.90. The commissioners adopted his idea, and experience proved it correct. This was in 1898, and since then the rate has been lowered gradually, until this year it is $1 and, after January 1, it will be 90 cents. As the rate has been lowered, the receipts have risen and, in 1903, were over two and one-half times as large as in 1898.

Cost of Asphalt Pavements in Winnipeg

THE work of City Engineer H. N. Ruttan, of Winnipeg, Man., is briefly summarized in his report for 1902. The amount of sewers built in that year aggregated 7.09 miles, making a total mileage of 65.67. Of asphalt pavements, 3.74 miles were constructed, 1.97 of macadam and 10.21 of cedar wood block and 3.91 miles of artificial stone walk. A number of improvements were made in the municipal asphalt plant, as suggested the previous year, thus increasing the output and reducing the cost of the work. The plant must be moved because of the expiration of the ground lease. Plans and estimates have been prepared for the new plant. In the accounts of the plant a balance of $14,496.79 remained from 1901, additions and extensions at one-half of cost amounted to $3,817.91, and, with depreciation at 5 per cent., the total was $17,398.97. The maintenance, operating and capital charges, for 1902, were $4,610.58, including maintenance and repairs to plant, $2,528.38; tools, one-half of cost, $333.88; interest at 4 per cent. on $18,314.70, $732.59; depreciation at 5 per cent., $915.73, and lost taxes, $100. Including repairs, there were 90,815.6 square yards of asphalt laid in 1902, and the average cost per yard was 5.07 cents. The new asphalt pavements laid during 1902 amounted to 83,726 square yards at a cost by day labor of $240,795.06.

London Municipal Lodging House

THE London County Council has just opened a new lodging house for men. It is to be known as "Carrington House," Deptford, and is the second municipal lodging house erected by the Council, the first having been opened in 1893 in Drury Lane. The latter has been crowded all the time and can accommodate 345 men. The charges were originally 10 cents for a cubicle, or small bedroom, but this was too low, and to make the house pay it was necessary to raise the rate to 6 pence, or 12 cents a night. The new building is larger and is six stories high. The dining-room has tables to seat 440 men at once, and in the centre is a large "hot plate" where the lodgers can cook their own meals. The reading room is about one-half the size of the dining hall, is lighted from three sides and above and is well ventilated. Seats and tables accommodate 176 men and on the sides are book shelves filled with books for the use of lodgers. Promenades are provided for the inmates and each lodger has an independent cubicle, thirty-six square feet in area and lighted by a separate window. The ceilings are nine feet above the floors and the petitions between cubicles reach within one and one-half feet of the ceilings.

The charges for a cubicle, use of lavatories, etc., are 12 cents a night. No room can be booked for a longer period than seven nights. A locker may be had for 12 cents for any length of time and, upon return of the key, 8 cents is refunded. Storage for parcels may be had at 2 cents a month. Private baths with hot and cold water, soap and towel, cost 2 cents. The whole cost of the lodging house to the Council was $43,155, the Deptford Borough Council contributing $52,390.

New Jersey First in Good Roads Work

THE palm must be given to the State of New Jersey for having the greatest mileage of improved roads. The annual report of Henry I. Budd, State Road Commissioner, shows that the State has 2,000 miles more of good roads than any other State in the country. Considering the small size of New Jersey—the forty-second in point of area—this record is all the more remarkable. Road improvements during the past year cost the State $250,000, or one-third of $750,000—the counties in which the roads are constructed bear two-thirds the expense. The amount appropriated by the State for good roads each year cannot keep pace with the petitions for new roads constantly being filed with the Commissioner. On the first of December, the date of the annual report, petitions for over 500 miles of new roads were awaiting the approval of the authorities. A portion of these roads will be built in 1904, as soon as the new appropriation is available, but, in the meantime, many more miles of road will have been petitioned for by different counties. There is a strong rivalry among the counties as to which shall build the greatest amount of good roads during the year.

Changes Suggested in Ohio Municipal Code

AT the meeting of the Executive Committee of the Ohio State Association of Boards of Public Service, a number of changes in the State Code were suggested. The Committee recommends that the Legislature so change the Code as to make boards continuous bodies, i. e., one member retiring each year so that the whole board will not retire at each political change. All money for building sewers should be collected in advance so that the contractor will not have to wait so long for his pay. At present, only the large concerns can get the work, as the small man has not the capital to tie up. The time of making improvements should also be shortened from the period of four months required at present. The Cleveland plan of requiring all property owners to make connections with the sewers, gas and water pipes before a street is improved, should be adopted. This would prevent the evil of tearing up streets after improvement. Every board of service in the State will be asked to recommend these changes to the Legislature. Mr. John Stollberg, of Toledo, is president of the State Association.

Low Price for Street Sweeping

THE report of the Commissioners of the District of Columbia gives some statistics regarding the amount of work done in cleaning the streets of Washington and the cost of the same. It appears that, during the fiscal year ending June 30, last, 523,077,805 square yards of paved streets were cleaned by hand, at a total cost of $91,180.78, as against 575,992,920 square yards at a cost of $79,704.46 for the previous year. The decrease was due to the necessity of suspending work for about thirty days to avoid a deficit. By machine, there were cleaned, 232,386,728 square yards, at a total cost of $41,829 62. The amount cleaned was larger by 24,857,540 square yards than that of the previous year, although the working time was a month shorter. The cost of cleaning by machine during 1902 was $37,355.08, the increase for 1903 being due to the increased area, as the contract price was the same—18 cents per square yard. In June, bids were called for a three years' contract for machine sweeping or flushing, the area of the latter to approximate 25,000,000 square yards per year. The lowest bid was 16 13-16 cents per 1,000 square yards and was accepted. During the summer months the streets in the business sections were flushed on alternate nights and it was found that this method thoroughly washed into the gutters and thence into the sewers the fine dust and other material that could not be removed by the machine or hand brooms.

Cost of Arc Lights in Taunton

DURING 1902, the municipal electric light plant at Taunton, Mass., has been operated for twenty-four hours each day. Incandescent lights were run for the full time, arcs for six hours, power seventeen hours and street lights all night. The last have burned 348 nights and the cost, figured in accordance with the rules of the Board of Gas and Electric Light Commissioners, was $19,086.09 for 247 lights, or $77.27 per light per year. The cost figured on the amount appropriated from the tax levy, less $500 for the construction account, is $74.70 per light. A cash balance of $6,114.28 is available for depreciation. The cost of the street lights, less the amount of interest paid on a new loan, was $15,797.61, making the cost of each light $63.96. Besides lighting the streets, the plant supplies 223 commercial customers with light and power. The receipts for the year amounted to $46,155.53, and the expenditures, including interest, $39,541.28, leaving a balance of $6,614.28.

Sewage Disposal in Columbus

IN discussing the plans for a sewage purification plant for Columbus, O., the suggestions of City Engineer Julian Griggs are interesting as giving some general information. He said that the septic tank and filtration plan of Mr. Rudolph Hering, C. E., are good to start with, but an experimental station should then be installed, and the Hering plan modified if the results of experiments show it to be advisable. This might cost $50,000. It should include the services of a chemist and a small plant, including a small pump to lift sewage from the intercepting sewer, to experiment with. The first step toward a permanent sewage disposal plant is the erection of a large sewage pumping station. This would not be an experiment, but a necessity whatever special plan of sewage disposal were adopted. The station would cost about $40,000. Then, the city should have the services of an expert on sewage during the establishment of a sewage plant.

Regarding the threat of the American Sewage Company, of Boston, to sue the city for any infringement of its patents on the septic tank and filtration plan, Mr. Griggs said that there is no need to worry about it, as it is much like a patent on drinking water. The company, he said, has tried to bluff several cities, but without success. The chemical precipitation plan is much more expensive than the Hering plan and the latter plan requires but one-fourth the filtering area.

Slight Increase in Cost of Public Arcs in Detroit

THE expenses of running the municipal electric light plant at Detroit, Mich., were increased in 1902 because the Commission, in recognition of the general increase of wages, increased the wages of its employees and also granted them a ten days' vacation with pay. The report of the Commission contains, as usual, a full and detailed account of the operations of the plant, showing how the price per arc is arrived at. The main dispute over the low price per arc has been on the matter of percentage of depreciation, outsiders, in many instances, claiming that the 3 per cent. depreciation given by the Commission is much too low. The argument of the Commission in support of this percentage is, that it is an average on the different items of property, as shown by the actual depreciation of different types, varying from 7 per cent. on the incandescent plant, arcs and switches, 5 per cent. on the steam plant, etc., to nothing on the land. In arriving at the cost of arcs, notwithstanding the percentage added to the cost for depreciation, maintenance, repairs and replacement costs are also added to the cost of operating.

The cost per kilowatt-hour is .02285 for 1902-3, as against .02291 for the year previous, while the cost per arc shows an increase of $1.58 over the latter period. The gross cost of arcs for 1902-3 is placed by the Commission at $64.36 and the cash cost at $41.03.

When the land asked by the Commission for the storage of coal is secured, the cost of arcs will be reduced, as coal can be purchased when the prices are low and stored against emergencies. Measures have already been taken looking toward the purchase of land on the Detroit River, $150,000 worth of bonds, originally allowed for the purposes of the Commission, having not yet been used, and this money would be available.

City Reserves Rights in Gas Franchise

THERE are some good features in the franchise recently granted by Sioux City, Ia., to the Sioux City Gas & Electric company and these are the provisions that the franchise shall not be in force longer than twenty-five years and that the city shall have the right to compel the placing of wires underground. But the latter is not well stated for this can only be done "when it shall be deemed necessary for the public safety." The city, however, is also to have the right to purchase the plants at the expiration of the tenth, fifteenth, twentieth and twenty-fifth years. The price to be paid is to be agreed upon by a representative of the city, of the company and a third to be selected by these two. The price must be what it would cost to duplicate the plants at the time of the purchase.

The price to be charged for gas is to be regulated as follows: Up to the first of January, 1904, the rate is to be not over $1.20 per 1,000 cubic feet; for one year thereafter the rate shall be $1.15 per 1,000; the next year $1.10 per 1,000; the next $1.05 per 1,000 and thereafter $1.00. The company may add 10 cents per 1,000 cubic feet to each of these prices if the bills are not paid before the tenth of the month following the one in which the gas was consumed. Electricity is to be furnished at the present rate and to the city at a price to be agreed upon. The city is to receive 2 per cent. of the gross receipts of gas and electricity sold to others than the city.

The city electrician shall have the right to inspect the construction and maintenance of all poles, wires, conduits, etc., and to make rules regarding the use and repair of the same. The city engineer is to have supervision over the laying of gas mains. Citizens may have their meters inspected by the city on complaint that the meters are not correct. If the meter is incorrect the company must remedy the trouble and pay the cost of inspection; if correct the citizen pays the cost. No charge is to be made for running pipes from the mains to the houses.

No Free Water Should Be Supplied by City

THAT the public buildings, Fire Department and non-consumers of water do not contribute towards the support of the Water Works Department, of Ogdensburg, N. Y., is the complaint of the Commissioners. About $7,000 worth of water is being furnished free to various public departments, and for seven years the general taxpayers have not contributed anything to the support of the Water Works, notwithstanding the privileges enjoyed and the protection from fire obtained by this water. The water consumer bears all the expenses and the Commissioners ask if that is right, especially when non-consumers receive fire protection along with the others. Superintendent H. A. Lord, in answering the question, "When will the Water Works become self-sustaining?" replies that "they have been self-sustaining properly since the service rendered the city at large has equalled or exceeded in value the amount raised by taxation in its behalf for operation and maintenance. This condition has existed for some twenty-five years. A balance of over $212 remained after all expenses of the year, 1902, were paid; $2,395.96 were spent on construction and $6,928.87 on operation and maintenance. The total disbursements, including an overdraught of the previous year in the sum of $790.98, amounted to $26,409.92, and the receipts aggregated $26,622.57. To the latter should rightly be added the sum of $7,535 for water supplied fire hydrants, parks, sewer flushing, schools, other public buildings, two hospitals, etc. Because of this drain, the Water Commissioners cannot extend the services as fast as they are desired and must allow parts of the system to deteriorate."

The Department bears all expense of material and labor required for laying originally a three-fourths-inch pipe from main to sidewalk. Renewals are made by the consumer, except that no charge is made for tapping, nor for curb cock and box, unless the tap be larger than the original, when the consumer pays the difference. There is a total length of twenty-six miles of three to twenty-inch pipe, twelve miles being cement lined and the rest cast iron. There are 151 fire hydrants of Mathews, Corey and Holyoke types.

A few instances of electrolysis have been discovered which lead the Superintendent to believe that much more of this trouble exists as yet unrevealed. Mr. Lord recommends that an electrical engineer be appointed to examine into the troubles.

Dissemination of Diseases by Dust

THE manner in which diseases travel has long been a puzzle, and antique quarantine arrangements are not generally looked upon as efficacious now-a-days, being generally adopted on the "must do something" principle. If the German experts are right, and they are just the sort of people to be right in a scientific question of this kind, dust is responsible for spreading disease. These experts say that there is every reason to believe that in many of our disease epidemics the dust-laden wind has been an effective agent in carrying them from one town to another. Sometimes the clouds of dust have been blown several hundred feet away, and small particles in the upper air have floated around for days before finally dropping to the earth again. In the upper currents of air they might travel a hundred miles before descending low enough to be breathed in by people. It has been estimated by the German experts, who have made more of a study of these questions than any other nationality, that tropical diseases have in this way been carried by the wind from the mainland to islands ten miles and more in distance. Heretofore it has been said that tropical diseases were more or less local, and that germs rarely reached an altitude of a few feet. But this must be modified in the case of germs which are carried upward by means of fine dust. While not light enough to float to any great distance in the air, they might easily be carried up there by the wind and then distributed around a wide area before falling. The germs which are destroyed by the warm rays of the sun would of course be killed by this exposure to the direct sunlight, but many of our worst disease germs are not injured in any way by the hot sun. They could easily be carried around indefinitely. These being the views of the most competent experts of the day, it is easy to see why quarantine is a failure. The wind bloweth where it listeth and uninformed authority strutting about on the platforms beneath is powerless in the matter.—*Indian Municipal Journal.*

Convicts Build Roads in Texas

THERE seems to be no reason why states, counties or cities should support in idleness those who have broken the law, and especially those who are serving but a short term in some minor institution. Organized labor has made strenuous efforts to prevent the employment of convicts in the manufacture of goods that will compete with free labor, but there is a way by which convicts may be employed to advantage, and, at the same time, not compete with free laborers. The man who is serving a term of a month, or a year, is a different proposition from one who is sent to the state penitentiary for a long term. Dallas County, Texas, has been using these short term men on its roads, and they are returning to the county more than it costs to support them. An act of the legislature in 1895 authorized the building of roads by the labor of county convicts. The County of Dallas is divided into four commissioner districts, each one in charge of a special road commissioner. The act provides that roads are to be constructed as nearly as possible, east, west, north and south from the city. When these roads have been constructed, the act provides further that four other roads are to be built to the border of the county as nearly midway between the first ones as is practicable. Then there are to be others between the roads already built, and in the end Dallas is to have a series of roads that will converge towards the city.

All convicts who are physically able to perform labor must work on the county roads. The work is to be under the supervision of a competent superintendent, and the work done must be of the best quality. Only macadamized roads are to be constructed, and already in Dallas County many such roads have been completed.

The number of convicts in Dallas County average about sixty. This, of course, refers to those who are able to work. The women, the old, infirm and physically unfit, are not compelled to work on the roads, but are taken care of on the county farm. This farm is also proving a means of saving money to the county. The revenues are considerable, and the provisions produced there by convict labor go a great ways towards sustaining the convicts.

Each of the convict camps on the public roads is in charge of a superintendent and four guards, and the average number of men in each camp is fifteen. The men are supplied with clothing and food, and are credited with fifty cents for each day they are held in imprisonment, this amount going towards the cancelling of their fines and the costs of the case. In addition, they are allowed 10 per cent. for good behavior while on the work. The records at the office of the county clerk show that the number who receive this credit are about one-half of the total number of prisoners. The total cost of maintaining one of these camps for a year is placed at about $7,000, inasmuch as the cost for maintaining the whole number was, in 1902 to 1903, $29,546.28. This gives an average of $492 per man. Of course, the labor of the convicts is not as good as that of skilled workmen, but as the county has no money to pay for labor on these highways, the work done by the convicts is better than not building roads at all. This work has done a great deal towards reducing the number of "hoboes" that heretofore were wont to frequent the district. "Hoboes" are not given to work, and during the winter months are glad to be sent up for short terms in some jail, where they can receive shelter, and, to them, a good living until summer comes again. Working on the roads is not to their liking, so they now give Dallas and its vicinity a wide berth.

Disposal of Refuse in Glasgow

CITY officials in the United States will be interested in the report of Mr. D. McCall, superintendent of street cleansing in Glasgow, Scotland, for the year ending May 31, 1903. The cost of the department for the year amounted to $465,090, of which $373,367.18 went for salaries and wages. The increase in the amount of refuse collected has been made by the increased facilities for disposing of the refuse by cremation. During the year 82,942 tons of refuse were taken care of—an increase of 23,893 tons over that of the previous year. Two new furnaces were erected, and extensions reported to be in progress will admit of the destruction of 133,000 tons of refuse per year. The residum from the furnaces is most valuable as a marketable commodity. In one of the new destructor works is a crematory chamber in which dead animals may be destroyed.

The old ash pits were abolished and portable bins introduced in 1901. A large amount of food unfit for use was destroyed during the year, and, in addition some five tons of old books, etc., were burned. The sale of clinkers for building houses, etc., has increased materially, and during the year a great part of the clinkers was used on the bacteria beds in the sewage disposal works. The separate collection of waste paper from business and private houses has extended during the year, and the appearance of the streets has been greatly improved on this account. A separate collection of bottles has been in operation since the latter part of 1901. For the year 1902, 64,734 old bottles were collected and sold. The collection of waste materials produced a revenue of $16,019.02, during 1902. The average cost per ton for the disposal of refuse, less carriage by the railroads, was a trifle less than 28 cents per ton, and the average cost per ton for collecting and removing street sweepings a trifle over $1.55.

Considerable trouble was occasioned the department by the number who threw refuse into the back courts, thus causing considerable additional labor on the part of the cleaners to remove this material. For the purpose of checking the evil notices were placed in every court-yard warning residents against throwing refuse into the yards. In the worst localities a watch was placed and fourteen convictions secured. A marked improvement has been observed in the condition of the courts. Glasgow's streets are frequently washed by means of a hose from the hydrants. During the year, 13,082,984 square yards of street were flushed, the cost being 38 cents per thousand square yards. The total average number of courts washed amounted to 613, while for the previous year 475 places were washed. The work of this portion of the department is rapidly increasing.

The street cleaning department owns a considerable amount of farm land, and the health committee expects to place a hospital upon a portion of it. During the past year $200,000 was spent in buying five farms with an acreage of 656. On one portion is a quarry which has been leased; there are also brick works in operation. The land owned, or rented, by the department is used to provide an outlet for unsalable refuse, and to provide the horses of the department with food.

Success of the Juvenile Court

THE purpose of the Juvenile Court is to prevent, rather than to punish, crime. The success thus far attending the work of these courts in several cities justifies their supporters in the belief that the good results will be permanent. The establishment of the Chicago Juvenile Court was the first legal attempt to judge the child outside the criminal court, but Judge Lindsay, of Denver, and Judge G. W. Stubbs, of Indianapolis, after the passage of the Illinois law, established branches of children's courts in connection with their courts before the legislatures of their States took any action. The Colorado Law was passed in March, 1903. Judge Lindsay took the stand that it was necessary to look at the misconduct of boys from the standpoint of the boy, when what, in a man would be crime, would not seem so if all the boy's surroundings were taken into consideration. Getting right down to the level of the boy, the Judge has had the greatest success in reclaiming boys and starting them on the right way to leading better lives. Every other Saturday the court is held. The Judge spends fifteen minutes in talking to the boys, cases are judged and reports received from the probation officers. Those having unfavorable reports must see the Judge at a special time, but there are usually not 5 out of 200 cases. The law provides that the parents or others may be judged and punished as accessories to a boy's crime if it be found that they did anything to lead him into the crime. The boys feel that the Judge understands them, and will treat them fairly and so he is able to extract the truth from them when the police fail. During the past year positions were secured for 200 boys that were brought to the court, and three-fourths have done well, The criminal court method of handling juvenile cases cost the county $42 a case, at present the cost is $10.

The first year of the Children's Court in New York has just ended and during that time 7,400 children under sixteen were arraigned. Justice Mayer classifies the children arraigned as: Mischievous children; those who commit crimes because of temptation; because of environment and bad association; because of parental neglect or incompetency; those who have criminal tendencies; those who are runaways and vagrants; those who are disorderly and incorrigible; and those who are neglected and abused by their parents. In the case of the first, a fine or commitment is rarely imposed, the judge pointing out why they should not do as they did and few offend a second time. Parole is usually placed on those of the second class and a high average of success is secured. The best hope for the third class is that they remove from their locality where they will be beyond the influence of the "Fagins" and other tempters. The procedure in the case of parental neglect is to commit to an institution. Children with criminal tendencies—who repeat offences—must be checked quickly and strongly and sent to a reformatory. Disorderly and ungovernable children must be sent to institutions, but it is permitted the judges to compel parents to pay for their keep and so prevent fraud. Commitment to an institution is also done in case of children who are neglected by their parents. The substantial success of the system of parole or probation has been secured.

After eight years of effort the Illinois Legislature was prevailed upon to pass the juvenile court law which went into effect in July, 1899. The success of the method was instantaneous, and other States fell into line. London and Japan even took it up and, in 1900, Wisconsin adopted a similar law. Then came Buffalo, Baltimore, and Cleveland in 1892, and now the States of Missouri, Colorado, Kansas, California, New York, Pennsylvania, New Jersey, Indiana, Connecticut, Minnesota, Louisiana, Delaware, and the District of Columbia have such laws. The law has worked so satisfactorily that many judges have not waited for the legislatures to act, but have put in practice in their own courts similar methods. It is claimed that the Colorado law is the best because it not only deals with the child, but goes at once to the cause of the delinquency.

During the past year, after much effort, the law was secured for Pennsylvania and provides: A separate time and place of trial for children without indictment; probation officers in every county; room separate from jail or police station for children awaiting trial; the requirement that one institution may not receive both dependent and delinquent children; the requirement that magistrates may not commit children to reformatory institutions, but that such commitment must be made through a juvenile court. The total number of children's cases in Philadelphia from June 14, 1901, to November 2, 1902, was 1,793, of which 1,112 were delinquents. Only twenty-four were brought back to court twice, and but three cases back the third time.

The first session of the St. Louis Juvenile Court was held in May, 1903, and in the period passed but two boys have been held for possible indictment by the Grand Jury where three or four boys a month were formerly held. After the law was finally passed it was made applicable to St. Louis and Kansas City only. Of the 255 children placed on probation in five months only 8 per cent. have been returned to court for sentence. Many more children are brought before the court than formerly because the police are required to report the arrest of every child to the probation officers, while before many children were discharged from the station houses.

New Plans for Baltimore's Sewer System

BALTIMORE is getting nearer to its needed sewer system. A special report has been made to Mayor McLane by City Engineer B. T. Fendall and Water Engineer Alfred M. Quick, on the cost of a sewerage system and its general character. In making their estimates the engineers had to assume the per capita and total amount of sewage to be provided for, the method and place of disposal, the details of design and construction of the system, and for how much of the complete system the loan should provide.

In estimating the amount of sewage, the engineers found that the figures given in previous reports of the Sewerage Commission were erroneous, for it was assumed that the total amount of water consumed reached the sewers. In 1897, the per capita consumption was placed at 120 gallons, but this amount was cut to 88 gallons in 1899, as the amount of consumption given by the Water Department. In 1902, Engineer Quick made some very careful estimates to determine the amount of water that could reach the sewers, and it was found that, out of a total consumption of 21,705,909,701 gallons, about 10,852,950,000, or 50 per cent., were consumed in such a way that they could not get into the sewer system as designed by the Sewerage Commission. This water included the water that is used in flushing streets and hydrants, for street fountains, for building, a large portion of water used for extinguishing fires, for elevators, escaping from leaks in water mains, etc., for the sewer system was not designed to take care of surface waters. Some sections of the city and outlying districts will not be included in the system, so the water consumed there could not get into the sewerage system. In addition, is all water that is taken care of by the storm sewers and is used in flushing them. Therefore, it is assumed, that about 50 per cent. of the total consumption of water could not reach the sanitary sewers.

The engineers speak strongly against allowing any crude sewage to flow into the bay. Chemical precipitation, they claim, would be expensive, unsatisfactory and was not recommended by either the Sewerage Commission or its engineers. Filtration in Anne Arundel county is the only plan recommended that is known to be feasible. "Some form of bacterial septic-tank treatment might prove successful and satisfactory, and would be most desirable on account of the great saving in cost as compared with the filtration project. Septic-tank treatment of sewage on a large scale is, however, comparatively new, and has been tried only in places much smaller than Baltimore. Mr. James Mansergh, the English expert on this method of treatment, who was consulted by the Sewerage Commission in regard to the matter, says that one feature of conditions here is wholly favorable to successful bacterial treatment of our sewage, and that is in having a sea outlet for the affluent from the filters; while the only feature of conditions here which he mentions as unfavorable is the greatly diluted state of sewage, due to the enormous volume per capita estimated by the Sewerage Commission to be collected. If, then, the greater part of this dilution is removed by eliminating from the sewers 50 per cent. of the water consumption, we believe that it may justify an experimental bacterial treatment of part of our sewage at Masonville, preliminary to the installation of the complete system, as suggested by the Sewerage Commission in its last report. This can be done in such a way that, if the

experiment is a failure, the system can be extended for filtration farther down in Anne Arundel county. We cannot, of course, assume that the experiment would be successful, and must, therefore, make an estimate for the more expensive and only positively feasible plan of filtration."

Since the volume of sewage is reduced from the amount for which the plans were drawn by the Sewerage Commission, a re-design of the whole system was necessary and this has been made by Mr. Quick. The only changes made were in the reduction in size of the various features of the system. The same conditions were taken as were used to govern the old designs. Thus, the maximum rate of flow is taken as one-half in eight hours; the same relative size of sewers, i. e., to flow half full at the maximum rate of flow for 1,000,000 people; the same grades, arrangement of pumping plant and disposal system; the same unit prices for work. The engineers are of the opinion that their estimate is a liberal one and that not only can a considerable reduction be made in price for work, but also a more economical construction for some of the sewers can be secured.

Taking into consideration that the sewers, once down, cannot well be enlarged, the loan should provide for sewers large enough to serve a population of 1,000,000 people. It would also be advisable to make the pumping station and accessories, except the machinery, large enough for the maximum number of people. Provision for pumping and disposal of sewage for 600,000 people would be sufficient for some years to come.

The engineers oppose the reticulation plan of the old Commission which desired that the cost of the lateral be charged against the property benefited. This would, in some cases, result in practically confiscating the property, and so provision was made for this reticulation system for 600,000 people in the cost of the system. Taking into consideration the above assumptions, the estimate for the whole system is given by the engineers as follows: Land for filtration, $128,000; preparing land, $930,890; building and utensils, $30,922; force and gravity mains, $840,000; right of way, $15,000; pumping station, $225,000; pumping machinery, $245,600; boilers, $24,000; intercepting sewers, $1,010,488; district mains, $525,000; reticulation system $2,025,000; total, $6,000,000.

Water Supply of Vladivostock

IT is interesting to learn something of the cities of Siberia in view of the trouble that is imminent between Japan and Russia in the far East. Vladivostock is situated on the Gulf of Peter the Great, in Siberia, just north of Korea, and occupies a natural position that would be admirable for a large city were advantage taken of the surroundings. At present, the water supply is inadequate and bad, although there are a number of natural wells and the drainage facilities are good. The city spends $900 per day for a water supply for its 40,000 inhabitants, giving an average of nine gallons per capita daily. Occasionally there is a serious fire and the fire department is not capable of handling it. Consequently the insurance is high. The property valuation is $6,000,000.

Comparing the water supply of the city with that of cities of the same size in the United States, we find that Binghamton, N. Y., has a population of 39,647, the per capita consumption is about 153 gallons per day, and the expenses for the year, including the filter service, amounted, in 1902, to a little over $317 per day. Brockton, Mass., population 40,063, has a per capita consumption of 33.23 gallons daily and over half of the services are metered. The total expense of running the plant, including maintenance and construction was, in 1901, $78,202.50, giving a daily cost of about $214. Both of these cities own their own plants and will serve as models from which the authorities of this Siberian city could pattern a plant for their city.

The great needs of this city, according to reports, are a suitable reservoir and waterworks and a city electric light plant. The cost of these utilities has been estimated and plans drawn, but nothing is being done to carry them out. A Russian company has offered to build the waterworks for $515,900, or a little more than the new city pays for water. An English firm has offered to put in the electric light plant, and the municipal board is now considering it. The whole trouble lies in the chaotic condition of affairs. The city is still a fortress with a commandant whose jurisdiction would naturally embrace the entire fortress, but there is also a military governor of the entire seaboard province with his official residence at Vladivostock. In addition there is an admiral of the port who resides in this city and a mayor of the city who is elected, or "appointed," presiding over a small council and inadequate revenues from taxes to pay the increasing expenses. With all these various authorities pulling in different directions, it is no wonder that things are at a standstill. The city is in a position to rival St. Petersburg, or Moscow, as the climate is never excessively hot or cold; there is little fog, a harbor open all the year round and a cosmopolitan population.

Municipal Asphalt Plant for New York

THE inadequacy of the plants of the private asphalt companies to make all the repairs to pavements that are necessary, has moved Commissioner of Public Works George Livingston, of New York, to recommend that a municipal asphalt repair plant be installed by the city. A very large number of complaints were made to the Department of Public Works respecting the bad condition of the pavements and it was found necessary to refuse to allow any more new work to be done until the streets were placed in fair condition. A permanent remedy, however, is needed, and Commissioner Livingston considers that it lies in a municipal plant. The central station, Commissioner Livingston thinks, should be located on board of a barge which could take on materials where they could be most conveniently had, prepare them afloat and deliver them for use along the water front as near as possible to the districts in which they are to be used. The construction of such a barge would be less than the rental of ground for a permanent station. If all the asphalt repair work was undertaken by the Borough of Manhattan, seven section stations would be needed and the gangs attached to them would be permanently employed. By means of these gangs the asphalt streets could be kept in order. He recommends that $100,000 be expended for such a plant this winter. The Grand Jury of last July called attention in a strong presentment to the bad condition of the asphalt streets and suggested the need of a municipal asphalt repair plant.

Manhattan has 198 miles of asphalted streets. By the end of 1904 about 446,400 square yards of these pavements will have become a borough responsibility because of the expiration of the guaranties. Not all of the pavements will revert in even fairly good order, for "delays in the making of repairs are invited by the reasonable prospect that the cost of maintenance will, by this means, be reduced." Furthermore, Commissioner Livingston said, "I am emphatically in favor of a radical change in the system under which asphalt paving is done. The continuing guaranty has been tried and has shown itself to be a failure from every point of view. Not only is it necessary to make good as they develop the defects of their original construction, but normal wear and tear must be constantly looked after and measures taken, almost from day to day, to correct the more or less reckless damage by those who ask for permits to cut pavements. The experience of every city has shown that a large part of the relatively enormous cost of street maintenance could be economized if repairs could be made when and where they are immediately needed. To the question, "Why do the companies which have entered into contractual obligations of maintenance fail to recognize the significance of the homely proverb, 'a stitch in time saves nine,' and postpone small repairs until they become large ones? the answer is very easily found. It costs them nearly as much to mend a small hole as to mend one a great deal larger. Hence, the tendency to neglect small repairs as long as possible, and to make large ones as easily as may be, thus bridging the term of the maintenance obligation until, at its expiry, the city finds itself with a pavement which invites discussion of the question whether to relay it or mend it will be the cheaper.

"My experience in such matters leads me to the unalterable conviction that a city, which, by exacting a maintenance contract, fancies it places the contractor for asphalt pavements at a disadvantage, deceives and defrauds itself. The theory is that the contractor who does good work can afford to guarantee it, and that when he does bad work such guaranty safeguards the public interest. Neither

assumption is correct. In the original price for work done the guaranty exacted must be paid for. That the contractor gives it for nothing can be assumed only by the very credulous. He is in business for profit, and must make his bid cover every contingency which his experience warrants him in anticipating. If required to give a bond, he charges all that the bonds cost him and usually more, notwithstanding the fact that he knows very well that the obstacles in the way of collecting such bond in the event of failure on his part to perform the contract obligations which it is supposed to secure are practically insuperable.

"Looking simply at the facts we find that, as a matter of average municipal experience, the maintenance contract establishes a high initial price and results in the neglect of pavements until in the end the city pays the full price and finds itself in possession of a pavement in a condition so bad that it can never be made uniformly good."

Payment on contracts should be deferred only long enough to make sure that the work was done according to the specifications and then the city should take hold. If it were possible to make the terms of a guaranty specific enough to be enforcible in law, the city would have to prove that any one of a number of causes did not make it void—such as change in vehicle tires, underground work, etc. It usually happens that, the courts grant a contractor the relief he prays for while the city pays without getting what it contracted for. The "guaranty fiction" should be abolished and pavements should be bought as are other municipal supplies, for cash or its equivalent, and should then be taken care of as carefully as possible.

Sanitary Reform in New Jersey

THE State Board of Health of New Jersey has started to reform sanitation under the act of the Legislature for the improvement of the local sanitary inspection service. The Board has issued a circular taking up the need for reform and giving the rules for examinations for licenses for health officers or inspectors and the subjects on which they are to be examined. It states that, in New Jersey, there are 445 sanitary districts in which the local authorities are empowered to take active measures for the protection of the inhabitants, yet in few are inspectors employed who have received any instruction in public hygiene. After sixteen years of observation, the Board has determined to adopt uniform methods to prevent the pollution of air, soil and water, the spread of diseases and the continuation of nuisances. A trained sanitary inspector will not wait for complaints, but will investigate the conditions in his district and report to his local health boards, which have all necessary laws at their command, to enforce reasonable demands. The membership of these boards changes but little, and so any policy is not liable to suffer sudden reversal.

The Act of 1903 provides that the health officer or sanitary inspector shall be the executive officer of the local board of health, and to enable these boards to secure trained men, the State Board of Health will hold examinations to determine the qualifications of applicants for the positions of health officers or inspectors. Four classes of licenses are to be issued by the Board: Health officers' licenses; and sanitary inspectors' licenses of the first, second and third classes. Licensed health officers shall be eligible to appointment by local boards of health and shall be the general agents for the enforcement of their ordinances. Sanitary inspectors of the first class so licensed shall be eligible to appointment by any board of health; those of the second class shall be eligible to appointment in any municipality except a city; and those of the third class may be appointed by any township. After the first day of January, 1905, no health board may appoint an inspector or health officer not licensed under the State Board.

The examinations for health officer or inspector are to be made by a board of examiners appointed by the State Board for one year, and all applicants for positions as health officers must pay a fee of $5, and those for positions of sanitary inspectors a fee of $3. These fees are to be applied to the salaries and expenses of the members of the examining board. After passing the examination, the applicant's name is to be entered on a list from which local health boards may make their appointments subject to the approval of the State Board. The circular further states the subjects in which the applicants are to be examined, the tests for the health officers being much more extensive than those for sanitary inspector. The Secretary of the State Health Board, Dr. Henry Mitchell, of Trenton, is prepared to furnish applicants and those interested in this work with all details.

Rules of the Road in New York

THE Board of Aldermen of New York has recently passed a new ordinance to regulate the traffic in the city, but the ordinance passed is, in many instances, radically different from that first offered by Deputy Police Commissioner Piper. After certain of the sections of this ordinance, will be found in parentheses the provision of the original ordinance. Some of the important sections are:

Turning and Starting—The driver or person having charge of any vehicle, before turning the corner of any street, or turning out or starting from or stopping at the curb line of any street, shall first see that there is sufficient space free from other vehicles, so that such turn, stop or start may be safely made, and shall then give a plainly visible or audible signal.

Turning to the Right into Another Street—A vehicle turning to the right into another street shall turn the corner as near to the curb as practicable.

Turning to the Left into Another Street—A vehicle turning to the left into another street shall pass to the right of and beyond the centre of the street intersection before turning.

Crossing Streets—A vehicle crossing from one side of the street to the other shall do so by turning to the left so as to head in the same direction as the traffic on that side of the street.

Stopping at Curb—No vehicle shall stop with its left side to the curb.

Vehicles Backed Up to Curb—In no case shall a vehicle remain backed up to the curb, excepting when actually loading or unloading.

Stopping Close to Curb Line—Unless in an emergency or to allow another vehicle (as provided in sections 16, 17 and 18) or pedestrian to cross its path, no vehicle shall stop in any public street or highway of this city, except close to the curb line.

Stopping Near Corners—No vehicle shall stop or stand within the intersection of any street, nor within ten feet of a street corner. (A space of twenty feet from the corner was required.)

Signal in Slowing Up or Stopping—In slowing up or stopping, a signal shall always be given to those behind by raising the whip or hand vertically.

Signal for Automobile—Every person driving an automobile or motor vehicle shall, at the request or signal by putting up the hand, from a person driving or riding a restive horse or horses, or driving domestic animals, cause the automobile to immediately stop, and to remain stationary as long as may be necessary to allow said horses or domestic animals to pass.

Slow Moving Vehicles—Vehicles moving slowly shall keep as close as possible to the curb line on the right, so as to allow faster moving vehicles free passage on the left. (Signs to this effect are being placed on street corners.)

Speed of Vehicles—The following rates of speed through the streets of the city shall not be exceeded, that is: Eight miles an hour by bicycles, tricycles, velocipedes and motor vehicles, however propelled, or by passenger and other vehicles drawn by horses or other animals, except that in portions of the city not built up, where the buildings are at least one hundred feet apart, a speed of fifteen miles an hour may be maintained.

Lights—Each and every vehicle using the public streets or highways of this city, except vehicles of licensed truckmen, shall show, between one hour after sunset and one hour before sunrise, a light or lights, so placed as to be seen from the front and each side; such light or lights to be of sufficient illuminating power to be visible at a distance of two hundred feet. (Licensed truckmen were not exempted originally from the provisions of this section.)

Exceptions—But this section shall not apply to any equestrian, or to any animal led or driven, not attached to any vehicle, nor to the rider of a bicycle, tricycle or similar vehicle, whose light has become extinguished, or who is necessarily absent from his home without a

light, when going at a pace not exceeding six miles an hour, when a clearly audible signal is given as often as thirty feet are passed over.

(The following section appeared in the original ordinance and was considered very important by Captain Piper: Unbitted Horses in Streets—No horse shall be unbitted in any street unless he is first secured by a halter, nor shall any vehicle be left standing in the street without an attendant, unless the wheels of the vehicle are securely locked.)

Driving on Sidewalks—Except as provided in this article, no horse or vehicle shall be driven, backed, led or allowed to stand on any sidewalk which has been curbed, except that wares or merchandise in process of loading and unloading, shipment, or being received from shipment, may be transferred from trucks or other vehicles over the sidewalk by the use of skids, or by backing up trucks on the sidewalks in so doing, provided a passageway is kept open within the stoop line of buildings for the free passage of pedestrians. (The use of skids or the backing of vehicles over sidewalks were not permitted in the original.)

Ages of Drivers—Drivers or persons in charge of vehicles other than licensed vehicles shall not be less than sixteen years of age, unless provided with a permit from the Police Department.

British Motor-Car Law

The rapid increase in the number of automobiles which use the streets and highways has made necessary such legislation as will protect the lives of pedestrians, while affording to the owners of the motor cars a fair amount of liberty. In England a general law has been passed known as the "Motor-Car Act," which goes into force on January 1, 1904, and under which motor cars will be regulated. The act is long and only a digest of its principal provisions can be given.

Every motor car will have to be registered with the council of the county or borough in which the owner resides, and every car will be assigned a separate number. A mark indicating this registered number must then be fixed on the car, and there is a substantial penalty for omitting to keep this mark easily distinguishable. The fee for registration is $4.86 for a car and $1.20 for a motor cycle. It will no longer be legally possible for any person to drive a motor car unless he is at least seventeen years of age or to drive a motor cycle unless he is fourteen years of age; and this license will have to be produced on the demand of a police constable. This requirement, if enforced, as it should be, will prevent the licensed driver handing over the care of the car to any lady or gentleman passenger on board who has the ambition to try his or her hand "at the wheel."

One of the drastic provisions of the act is as follows:

"If any person drives a motor car on a public highway recklessly or negligently, or at a speed or in a manner which is dangerous to the public, having regard to all the circumstances in the case, including the nature, condition, and use of the highway, and to the amount of traffic which actually is at the time, or which might reasonably be expected to be, on the highway, that person shall be guilty of an offense under this act." The justices are to consider the use of the highway and the amount of traffic which may be "reasonably expected" on such highway, in judging of the recklessness or negligence of the driver. The provision gives the first claim to the road to its ordinary traffic. The motor driver must be always on the lookout for the traffic which has the prior claim to the use of the highway. Moreover, there is power under the act to prohibit or restrict the driving of any motor cars on any part of a road which does not exceed 16 feet in width or "on which ordinary motor-car traffic" would be especially dangerous.

The limit of speed for a public highway is placed at twenty miles an hour and within any limits or place referred to in the regulations made by the local government board the speed is limited to ten miles an hour. The question of speed is to be revised at the end of three years.

Penalties for violations of this act run as high as $243, with the alternative of three months' imprisonment. Local authorities will have to erect not only notice boards indicating any special limitation of speed, but also boards showing dangerous corners, crossroads, etc.

Statistics of Arc Lighting in United States Cities and Towns

	Population, 1900.	No. lamps.	Watts at lamp terminals. Open.	Watts at lamp terminals. Closed.	Schedule. Open.	Schedule. Closed.	Hours burn per year.	Cost coal per ton.	Contract price per lamp per year.
PENNSYLVANIA (Concluded)									
McDonald	2,475	23	5	480	...	(1)	4,000	$1.75	$65.00
McKeesport	34,227	...	1,100	...	480	(1)	3,650	.85	73.00
McKees Rocks	6,352	150	100	...	480	(1)	3,700	1.45	82.50
Mahanoy City	13,504	48	...	480	...	(1)	4,000	1.38	95.00
Manheim	2,019	...	24	...	...	(2)(3)	1,650	2.50	60.00
Marysville	1,463	...	5	...	...	(1)	4,000	2.50	50.00
Mauch Chunk	4,029	114	...	480	...	(1)	4,000	W. P.	75.00
Mechanicburg	3,841	...	47	...	430	(3)	1,825	2.25	47.10
Mifflintown	953	25	...	480	...	(1)	4,000	2.30	75.00
Milton	6,175	60	...	480	...	(1)	4,000	2.00	72.00
Monongahela	5,173	22	...	480	...	(1)	4,000	1.60	90.00
Mt. Carmel	13,179	96	10	480	550	(1)	4,380	1.50	96.00
Mt. Pleasant	4,745	76	2	480	...	(1)	4,000	1.00	70.00
Nazareth	2,304	26	...	340	...	(2)(3)	1,220	2.00	45.00
New Brighton	6,820	171	...	340	...	(1)	4,000	1.85	65.00
New Castle	28,339	183	...	480	...	(1)	4,000	1.50	75.00
Norristown	22,265	29	...	480	...	(1)	4,000	2.50	59.00
North East	2,068	50	5	480	...	(3)	1,825	(6)	34.00
Parkesburg	1,788	33	...	480	...	(1)	3,650	2.55	93.33
Patton	2,651	...	13	...	430	(1)	4,000	1.00	75.00
Philadelphia	1,293,697	8,871	...	480	...	(1)	4,100	...	108.40
Philipsburg	3,226	25	...	480	...	(1)	4,000	...	97.50
Phoenixville	9,196	79	...	480	...	(1)	4,000	2.79	21-90 58-85
Pittsburgh	321,616	... 1,433	154 1,425	480	480	(1)	4,015	.90 1.30	80.00 96.00
Pittston	12,556	100	...	480	...	(1)	4,000	.80	75.00
Plymouth	13,649	60	...	480	...	(1)	3,700	1.25	75.00
Pottstown	13,696	80	...	340	...	(1)	3,950	2.50	75.00
Quakertown	3,014	45	...	340	...	(1)	3,300	2.45	z52.75
St. Clair	4,638	30	13	480	550	(2)(1)	2,400	1.25	60.00
Sewickley	3,568	57	1	480	...	(1)	4,000	Gas	70.00
Shamokin	18,202	80	9	480	...	(1)	4,380	1.50	90.00
Sharon	8,916	...	66	...	480	(1)	....	1.50	74.00
Shenandoah	20,321	56	...	480	...	(1)	4,000	1.75	95.00
Shickshinny	1,456	24	...	480	...	(2)	2,179	1.85	z18.00
Somerset	1,834	21	...	480	...	(1)	4,000	1.35	60.00
Speers	369	...	34	...	...	(1)	4,000	.85	80.00
Steelton	12,086	42	40	340	...	(1)	4,000	2.50	75.00
Stroudsburg	3,450	75	4	340	...	(2)	2,250	2.25	67.00
Sunbury	9,810	90	70	...	480	(1)	4,300	1.65	70.00
Susquehanna	3,813	...	80	...	480	(1)	4,000	4.00	100.00
Tamaqua	7,267	82	...	480	...	(1)	4,000	.80	80.00
Tarentum	5,472	72	4	340	...	(1)	4,000	1.10	z
Taylor	4,215	...	130	...	430	(1)	4,000	.85	75.00
Titusville	8,244	119	...	480	...	(1)	4,000	Gas	z36.72
Towanda	4,663	40	...	480	...	(4)	1,567	1.50	60.00
Tyrone	5,847	102	...	480	...	.....	3,285	1.00	70.00
Uniontown	7,344	104	3	480	...	(1)	4,000	1.19	70.00
Warren	8,043	41	...	340	...	(1)	3,833	Gas	75.00
Washington	7,670	87	...	480	...	(1)	4,000	1.35	84.00
Waterford	767	15	...	480	...	(3)	1,825	2.55	50.00
Waynesboro	5,396	40	...	480	...	(1)	3,600	2.85	80.00
Waynesburg	2,544	...	9	...	...	(1)	4,000	Gas	80.00
West Chester	9,524	...	71	...	...	(1)	4,015	2.80	80.00
Wilkes-Barre	51,721	361	...	480	...	(1)	4,000	1.38	300-75 61-64
Williamsport	28,757	218	...	480	...	(1)	4,000	2.10	74.50
York	33,708	300	...	480	...	(1)	4,000	2.40	74.82
RHODE ISLAND									
Bristol	10,102	...	90	...	430	(3)	2,000	3.50	59.31
Newport	22,034	115	...	480	...	(1)	4,000	3.60	167.90
Pascoag	3,500	54	...	340	...	(2)(3)	1,220	4.12	.....
Pawtucket	39,231	516	45	...	...	53(1) 508(4)	4,000 2,190	3.50	112.50 72.50
Westerly	10,000	27	...	340	...	(3)	1,825	4.00	75.00
Woonsocket	28,204	146	...	480	...	(1)	4,000	4.60	146.00
SOUTH CAROLINA									
Abbeville	3,766	...	43	...	430	(2)	2,520	3.25	60.00
Aiken	3,414	34	...	480	...	(1)(2)	2,179	4.00	72.00
Anderson	5,498	...	100	...	430	(1)	4,000	3.25	45.00
Camden	2,441	...	34	...	...	(2)	2,179	3.20	80.00
Charleston	55,807	...	112	...	430	(1)	3,566	3.35	100.00
Columbia	21,108	...	191	...	340	(1)	3,650	3.20	65.00
Georgetown	4,138	43	4	480	...	(2)	3,828	4.25	80.00
Greenwood	4,824	42	1	340	...	(2)	2,179	Wood	z
Newberry	4,607	50	...	480	...	(2)	2,179	Wood	80.00
Orangeburg	4,455	50	...	480	...	(2)	2,179	3.65	z
Sumter	5,673	40	...	480	...	(2)	2,179	Wood	75.00
Union	5,400	53	1	480	...	(2)	2,500	3.25	56.62
SOUTH DAKOTA									
Aberdeen	4,087	19	...	480	...	(1)(2)	2,179	Gas	125.00
Bowdle	622	...	4	...	550	(2)(3)	1,400	....	100.00
Brookings	2,346	12	8	480	...	(2)(3)	1,220	5.00	8-66 12-96
Canton	1,948	68	...	340	...	(2)(4)	1,567	2.50	84.00
Deadwood	3,498	15	...	480	...	(1)	4,000	4.00	180.00
Hot Springs	1,319	10	...	480	...	(1)(3)	2,730	W. P.	96.00

(1) All night. (2) Moonlight. (3) Midnight. (4) After midnight up to 1 or 2 A. M. The difference in time may be judged from the column showing number of hours lamps burn. (6) Rent power. City owns lamps and dynamo. z Municipal plant.

The data given in the above table were collected by the General Electric Company, Schenectady, N. Y.

(To be continued.)

PLAN TO PREVENT CONGESTION AT STREET CROSSINGS

How to relieve the congestion of traffic which prevails at every important street crossing in New York is undoubtedly the most important problem which confronts the city to-day. The alarming number of accidents befalling pedestrians while crossing the streets has made it manifest to those interested in municipal questions that something more efficacious than the building of "isles of safety" or the enactment of traffic ordinances must be done if the record of "a death a day" is to be reduced.

The intersection of Forty-second street and Fifth avenue is one of the points where the conditions are particularly bad. The army of pedestrians which is constantly traversing the great crosstown thoroughfare must now thread their perilous way across Fifth avenue—the principal highway in the city for carriages, automobiles and other swift-moving vehicles. A number of plans of relief have been suggested. One of these calls for changing the grade of Forty-second street so that it would pass under Fifth avenue. This scheme has many obvious disadvantages which condemn it as impracticable. Were it otherwise free from objection, the time consumed in excavating, regrading, etc., would render it highly undesirable, as New York has had enough of upturned thoroughfares especially at Forty-second street. What is wanted is *immediate* relief and by some method which will not seriously block the streets while improvements are being made .

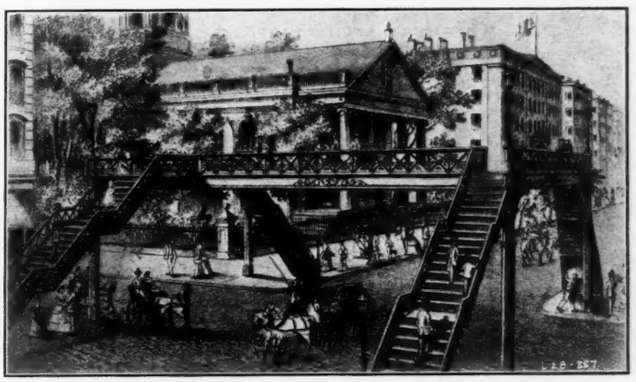
The best scheme so far proposed is the erection of a bridge equipped with escalators* across Fifth avenue, as shown in the large illustration. The escalator has come to be known and appreciated by almost every one through its use in department stores and at some of the "L" stations, and the public would undoubtedly welcome its installation in this locality.

The scheme of building a bridge over a busy street is by no means new. Back in 1867, the City Fathers sanctioned the erection of a bridge on Broadway across Fulton street. The small cut, reproduced from the city manual of 1867, shows the appearance of the structure. The same publication records that although the bridge was much used at first, it soon fell into disuse as the public preferred to brave the dangers of the street rather than to climb tediously up and down the stairs. But inventive genius has, as usual, eliminated the difficulty which prevailed forty years ago; for, as is generally known, the use of the escalator involves simply stepping on one of the slowly moving units while it is still traveling in a horizontal plane and stepping therefrom (also while it is moving horizontally) when one has been transported as far as the device was designed to carry him, which, in this case, would be the other side of Fifth avenue.

With the plan here outlined carried out, the uncounted thousands using the city's greatest crosstown thoroughfare (including the multitude going to and from the Grand Central Station) would be carried without physical exertion at a safe distance above the dangerously dense vehicular traffic of Fifth avenue.

This plan would also provide for future needs as (alas!) so few of our transit plans do. By using the proper width of steps, the original installation could be designed to amply provide for present needs. When interest of traffic should make increased capacity necessary, the bridge can be readily widened and another escalator installed side by side with the original.

A similar improvement could readily be carried out at other locations. In fact, the solution decided upon by the engineers of the Interborough Railroad Company for protecting pedestrians at Herald Square is quite similar to the proposed Fifth avenue-Forty-second street improvement, although at Herald Square the "L" patrons alone are to be benefited. As will be remembered, the Interborough company recently announced that it was about to build an escalator at Thirtly-third street to carry passengers from the sidewalk on the west side of Sixth avenue to a foot bridge over the trains. From this foot bridge, passengers may readily descend to either the uptown or downtown stations.



A RELIC OF THE PAST

* For description of the Escalator, see THE MUNICIPAL JOURNAL, p. 91, Feb., 1903.

PROPOSED SOLUTION OF CONGESTION PROBLEM AT FORTY-SECOND STREET

INDEXED

A MODERN ASPHALT REPAIR PLANT

THERE are many miles of asphalted streets in American cities, many in good, but more in poor condition. Many factors enter into the deterioration of the pavement, but one of the most prominent is the rapidity with which small breaks or bad spots in such pavements will spread unless repairs are made at once. The need for quick repairs was strongly urged in the recent recommendations of Commissioner of Public Works Livingston, of New York City, regarding the installation of a municipal asphalt repair plant.

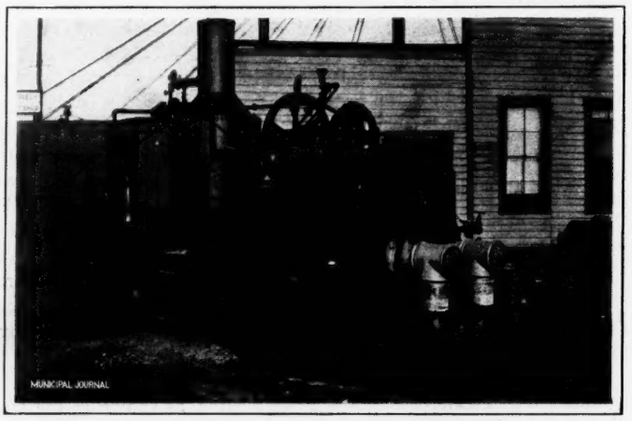
All repair outfits must, for obvious reasons, be easily portable to be of most service in a city of any size. Great care should be taken, in installing such a plant, to see that it can meet all the requirements of such work, for it is easily possible to do more harm than good when making repairs if proper appliances are not employed. During the past year two new appliances have been developing for the repair of asphalted streets and all signs point to the fact that they are successfully doing this kind of work, and that, with them, asphalted surfaces can be maintained in much better condition and at greatly reduced cost. Feeling that municipal authorities and contractors will be interested in an efficient repairing outfit, the following descriptions of the two appliances referred to is given.

DESCRIPTION OF ASPHALT MIXING PLANT

The Toledo Patcher is a complete asphalt mixing plant, mounted on strong wheels, which permits of its being moved to a place contiguous to the work, thus enabling the delivery of the mixture to the street without loss of temperature. The kettle is heated by steam and supplied with an air agitator, so the asphaltic cement is kept at a uniform heat and all possibility of scorching is eliminated. The drum, which has several new features, has a capacity of heating sufficient sand to lay from 500 to 700 yards of pavement a day; the boiler is a rapid steamer of marine type, Westinghouse double engines furnish ample power and the different parts are so assembled as to perform the work as nearly automatically as is possible, thereby reducing the number of laborers required to a minimum. One of these plants was working for some weeks in Detroit, Mich., during the past summer, without having to shut down once for repairs.

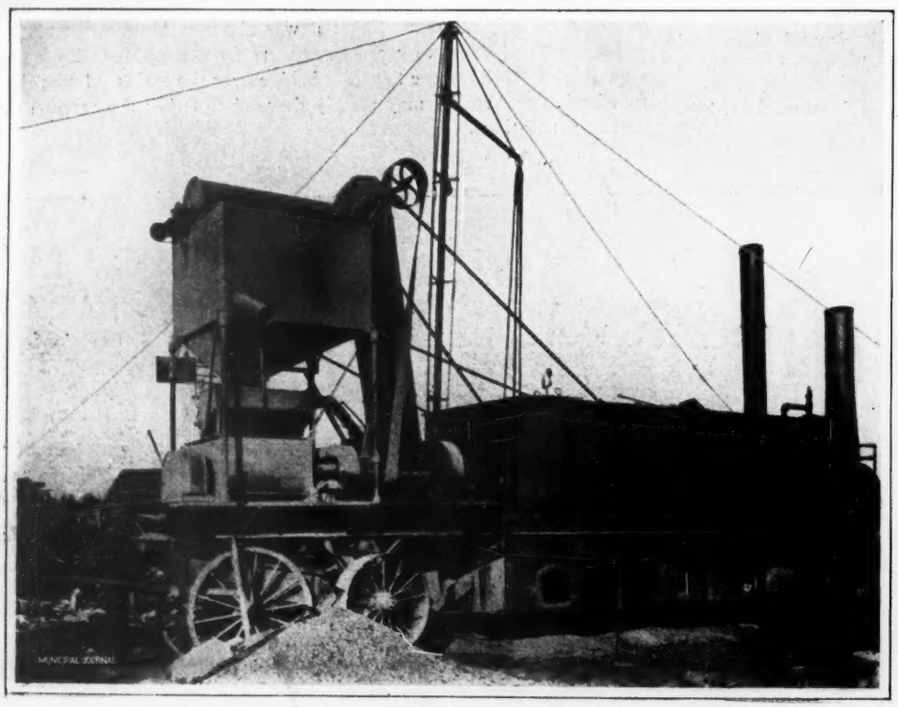
SURFACE HEATING APPLIANCES

The Economic Asphalt Surface Heater is built on entirely new lines and seems to accomplish perfectly that which has been attempted ever since asphalt has been used as a paving material, namely: repairing the surface without cutting out the old material. A glance at the accompanying illustration will help one to understand the principle upon which this appliance works. As will be seen, the machine is steam propelled. At rear of the boiler is a semi-circular cylinder in which fuel is burned in suspension and through which is forced some 2,000 cubic feet of air per minute. This air is heated in its passage and, combined with the products of combustion, passes out through the down flow pipes to the hood which is placed over the spot to be repaired. Heretofore, all attempts to reheat asphalt surfaces have resulted in burning and,



ECONOMIC ASPHALT SURFACE HEATER

consequently, in destroying the pavement, as in every case the flame has been forced directly on to the pavement. With the Economic Heater, however, this danger is entirely overcome through a tempering device by means of which a current of atmospheric air is mixed with the heated blast just as it leaves the chamber, reduces the temperature to any desired degree and maintains it steadily at that point. No flame ever reaches the pavement, as has been the case with other machines designed for this purpose, so that all possibility of burning or injuring the asphalt is avoided. If a piece of iron is placed in a kettle of boiling water, it cannot absorb more than 212 degrees of heat, no matter how long it may remain there; just so with the Economic Heater. If the outgoing blast is tempered to 400 degrees of heat, then it is self-evident that the pavement can be heated no hotter than 400 degrees. This point being attained, all objections to reheating asphalt are removed. The pavement, being warmed, can be raked as when new, fresh material can be added to restore it to grade, holes filled, shoved parts smoothed out, and the union between the old and new material cannot be detected after the cement coating has attained the color of that on the old work.



THE TOLEDO PATCHER—PORTABLE ASPHALT MIXING PLANT

In recommending a municipal asphalt repair plant, as mentioned above, Mr. Livingston called attention to the well-known fact that contractors, having guaranteed an asphalt pavement for a certain number of years, are very dilatory about keeping it in proper repair, allowing large holes to develop, to the detriment of the whole pavement, before making repairs. He insisted that it would be much wiser for the city to take entire charge of the pavements after completion by the contractors, thus saving in cost due to the guaranty.

The Patcher and Heater described are made by The Toledo Construction and Supply Co., Toledo, O.

YOUNGSTOWN'S FIRE DEPARTMENT

Steadily Growing in Size and Efficiency—Steam Fire Engines Lately Substituted for Direct Water Pressure—How Youngstown Compares with Other Cities

By Our Special Correspondent

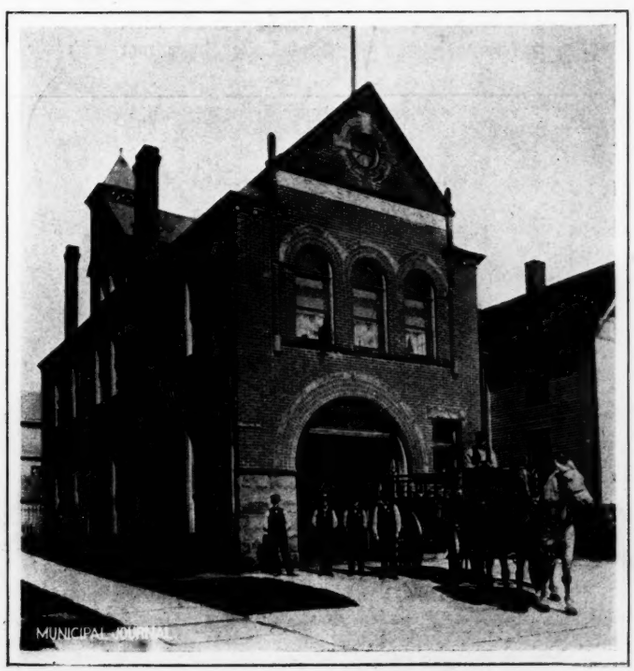
CHIEF W. H. LOLLER
Youngstown, O.

It is not surprising that a city should grow rapidly in population when it is as advantageously situated as is Youngstown, O. It is midway between Pittsburg, Pa., and Cleveland, O., and is one of the great iron manufacturing centers of the country. It is a lively, up-to-date, business-like city and is not unlike Pittsburg in many of its characteristics. The population in 1900 was 44,885, but at present these figures are much too small, and 58,000 would more nearly approach the correct amount.

The area of the fire limits of the city amounts to eleven square miles. To protect the inhabitants within these confines from fire—and the large number of manufactories make the danger from fire especially great—Fire Chief W. H. Loller has to depend on a very small number of men. While the loss from fire, last year, was fairly large for a city this size, there were many other cities of similar size in which the property loss was greater, although the fire departments in them were larger and better equipped than that of Youngstown. In that city, last year, the loss on buildings amounted to $33,335.84, and on contents, $56,969.49, the net loss over insurance being but $5,086.99.

Paid Fire Department Formed

Previous to May, 1891, the Fire Department of Youngstown was a semi-volunteer organization, otherwise known as a "call force." In the year stated the needs of the city required a full paid department, and so a force of seventeen men was organized. This number included the Chief, William H. Moore, and Assistant Chief, William L. Knox. There were then but three stations and ten of the men were assigned to the central station, and three each to stations Nos. 2 and 3. At the same time, also, the Gamewell fire alarm system was placed in service.



STATION NO. 5, YOUNGSTOWN, O.—ERECTED 1896

The central station was not adequate for the needs of the department, so in 1894 the Legislature of Ohio permitted the City Council to issue bonds for the present headquarters, shown in one of the accompanying views. In November of the following year, the citizens voted to bond themselves further for the erection and equipment of stations Nos. 4, 5 and 6.

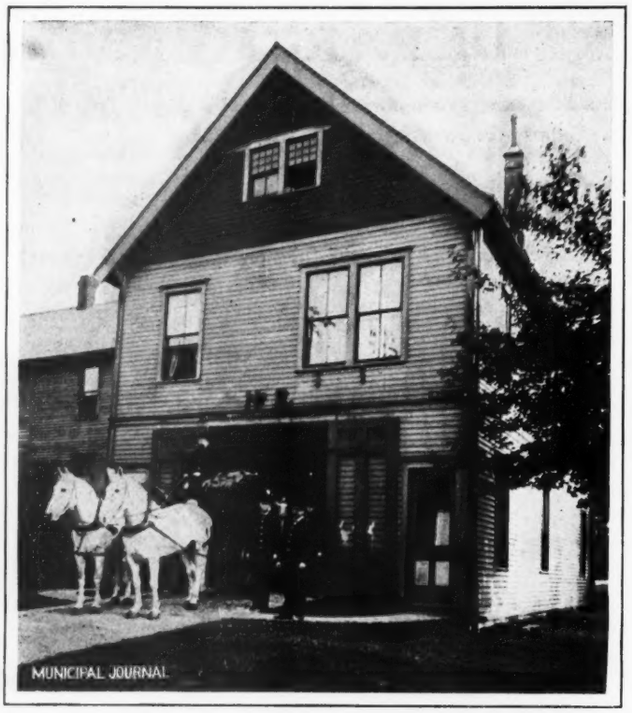
FIRE HEADQUARTERS, YOUNGSTOWN, O.

Chief Moore and Assistant Chief Knox served until April, 1901, when the Board of City Commissioners retired them under the provisions of the fireman's pension law, and promoted William H. Loller and Thomas C. Reilly to the positions of Chief and Assistant Chief, respectively. The appointments came naturally from the good records of the men while in subordinate positions. The Chief, who understands how a fire department should be conducted to obtain the best service, has gradually introduced a number of changes that have taken the Department out of the ruts and has endeavored to keep abreast of the times. Discipline the Chief insists upon at all times, but only so far as is required to keep the men up to their duties. He allows the men all the liberty that is consistent with proper order, for he fully appreciates the confining nature of their duties.

Reforms Introduced

The Chief has, among other things, required the men to become more familiar with the apparatus which they are required to handle, and to that end, had an old aerial truck that had not been used for some time placed in service so that all the members of the Department could learn how to operate it. Daily drills are also held with the life-net, in the coupling and uncoupling of hose, in the practice of hitching and in all the various duties which prompt response to alarms of fire necessitate.

In fighting a fire it is a great advantage to the firemen if they are familiar with the general interior construction of a building; if they know the passageways, location of stairs, character of the building's contents and of the material of which it is built. Recognizing the value of such information, a system of building inspection has been



ONE OF YOUNGSTOWN'S OLD STATIONS

established that has, without doubt, resulted in the prevention of many fires. Periodical inspections of all the buildings in the business sections of the city are made under the direction of the Chief. This inspection enables the Department to see that the laws relating to fire prevention are complied with, and keeps the firemen familiar with the character of the buildings in which they may, at any moment, have to fight a fire.

In addition to the above precautions, the cause of every fire is carefully ascertained, and last year three persons were convicted of arson on evidence furnished by the Department. The last report of Chief Loller shows but five fires in which the cause was "matches," the cause so often given when the real reason is unknown. No fire was recorded as "cause unknown."

During the past year the Department has responded to 276 alarms —the largest number of any year in the history of the city. Only one general alarm was sounded and that was in the case of a large factory where the loss amounted to over $45,000. The loss would not have been so large had not there been a delay in sending in the first alarm.

The Equipment

At present the Department consists of an aerial truck, a service truck, three combination chemical engines and hose wagons, two hose wagons and two buggies. A Silsby steam fire engine is held in reserve. In the central station are located a combination wagon, the aerial truck having a seventy-foot ladder, the service truck and the steamer. Each of the other five stations have either a hose wagon or combination wagon and a wagon for exercising. There are twenty-three horses in the service. The manual force consists of Chief Loller, Assistant Chief Reilly, six captains, thirty-five firemen, one electrician and one lineman. The number of men has been added to keep pace with the needs of the service. In 1902 the number of firemen was twenty-nine.

Until recently the direct pressure system for extinguishing fires has been employed. The city owns its water works and the pumping plant forces the water into two standpipes, each having a capacity of 528,000 gallons. Chief Loller has urged that the direct pressure system be abandoned in favor of steamer service. Under the direct pressure system when an alarm of fire is received, it was necessary to increase the pressure from eighty pounds, which is required for domestic service, to 160 pounds for fire purposes and, until the nature and extent of the fire could be ascertained, this larger pressure was maintained. This imposed a strain not only on the water works machinery, but also on the many lines of pipes and made liable a breakdown at a critical moment during a fire.

In the downtown districts the increase in business has been followed by the increased height of buildings. While there was in reserve a steam fire engine with a capacity of about 350 gallons a minute, this was too small and needed to be supplemented by other and larger engines. Chief Loller recommended at least three more engines for use in the city. Ever since taking charge of the Department, he has urged the purchase of steamers and has pointed out the fact that the growth of the city and the changes from smaller structures to larger and higher ones rendered fires more difficult to fight. His recommendations in this direction have been carried out by the Commissioners.

As in other departments, the use of chemicals for small fires has steadily increased, for the quickness with which they can be thrown on the blaze after the arrival of the apparatus and the minimum loss from water make the chemical engine a most useful adjunct to any department. In 1901 49 per cent. of all the fires was extinguished with chemicals; in 1902, 45 per cent. Thus, in nearly half of all the fires, great loss from water was prevented—a loss that is usually many times that caused by the flames.

As the outcome of the Chief's recommendations of last year, the City Commissioners made provision for a new station, No. 7, which is now in the course of erection at the corner of Madison avenue and Elm street. The station was needed because the companies covering the territory were compelled to travel up hill in responding to alarms. The station is on the summit of the hill and so the apparatus will have only down grades to cover in event of alarms. The new building is of buff brick with stone trimmings and cost $21,000.

Wires in Business Section Should Go Underground

Chief Loller has been urging that the network of wires, that obstruct the streets and render it difficult and dangerous for the firemen to work, should be placed underground. He also has recommended that an ordinance should be passed governing electrical construction, that all persons be compelled to secure a permit before stringing wires and that such wires be inspected before being placed in service. Another ordinance should be passed to prevent the obstruction of fire hydrants and the passage of the apparatus through the streets. On several occasions hydrants have been completely covered. Regulations for the sale and storage of gasoline and other inflammable oils should be passed by the authorities, for to these substances is due a large part of the fires in all cities.

Other recommendations of Chief Loller have met with success,

NEW FIRE STATION UNDER COURSE OF ERECTION

and the Commissioners have purchased a three-way deluge set, 1,500 feet of hose, and a storage battery for the fire alarm in place of the old gravity battery. This is now being put in place and will cost for maintenance about $25 a year as against the sum of $300 for the old system.

A comparison of Youngstown's department with those in cities of similar size will be interesting. The statistics below were collected in the first part of 1902 and, while not representing the actual conditions to-day, will serve as a basis of comparison, inasmuch as they were all recorded at the same period:

	Population, est. Jan., 1902.	Firemen. Regulars.	Firemen. Others.	Engines. Steam.	Engines. Chemical.	Engines. Combination chemical.	Hose carts.	Trucks.	Feet of hose.	No. fires.	Property loss.
Yonkers, N. Y.	51,000	42	725	..	..	5	12	5	32,000	188	$126,087
Norfolk, Va.	55,000	50	2	5	1	3	14	2	18,200	212	32,387
Waterbury, Conn.	48,139	23	137	2	..	1	6	2	10,000	116	18,951
Holyoke, Mass.	47,612	39	94	6	2	1	5	3	9,700	182	33,491
Ft. Wayne, Ind.	51,000	57	...	7	1	..	6	2	23,300	193	49,241
Youngstown, O.	50,000	37	...	1	..	4	8	2	13,450	207	90,305
Houston, Tex.	50,000	63	...	7	1	2	2	2	7,250	297	253,672
Covington, Ky.	43,500	33	...	3	1	..	5	2	13,450	104	49,040
Akron, O.	45,000	40	18	6	1	4	5	2	4,000	149	68,213
Dallas, Tex.	50,000	53	...	4	2	..	2	3	6,850	334	507,802
Saginaw, Mich.	45,000	33	14	1	..	..	6	2	10,000	199	50,752

The Past Year in Capitol City Police Force

THE operations of the Police Department of the District of Columbia for the year ending June 20 last were set forth in the report of Major Richard Sylvester, superintendent of the Metropolitan Police. At the time of the report there were in the Department 590 privates, and fifty-one officers, all of whom were not available for patrol duty because of detective service, details, etc. According to the Major there is a shortage of ten sergeants and, in recommending the increase in the force, the exacting duties of the officers are called to the attention of the authorities.

The salaries of the patrolmen should not only be raised, but also graded from $900 to $1,200 a year for privates. Two years' satisfactory service should be followed by promotion in pay to $1,080 and in five years to $1,200 a year. At present six sergeants are in command of the bicycle squad, but do not receive higher pay than that of patrolman, and the Major recommends that these men be paid salaries received by other sergeants. The last session of Congress appropriated funds for an increase of forty men at $720 a year, and this Major Sylvester characterizes as not being "in the line of economy coupled with good service," for the proper material for these positions could not be secured and the pay is too small for the men to live properly. An advance to $900 should be made in the salaries for these men. Among the other recommendations, which make a total increase of $85,800 over last year, is an item of $20,000 for a new station.

The Superintendent does not think that the club and revolver can be dispensed with as means of defense, as the conditions in some sections are so dangerous that officers travel in pairs. The Major recommends a law to keep children off the streets after a certain hour of the night unless accompanied by an older person, and a thorough and properly equipped probation force. Thus far the present probation feature relating to the disposition of the juvenile cases is not a success. This is due not to the system, but to the fact that the system is not carried far enough. There should be ample authority to compel the parent or guardian to take proper interest in the child. Release should only be granted after full investigation by the probation officer.

The recommendation is repeated for better sanitary conditions in the stations. More light and air should be given the prisoners and padded cells should be provided for the insane. The trials at police courts come in for considerable attention on the part of the Major. In making arrests after the courts close, the officer must not only finish his tour of duty, but also appear in court and remain there until his case is disposed of. Business men are often required to spend considerable time away from their business to serve as witnesses and, although a prisoner may be acquitted, he is compelled to travel from station to court in a patrol wagon. To remedy the trouble, it is proposed that magistrates shall determine cases at the several station houses every morning and evening. Police courts should be retained for jury trials only. The salaries of these magistrates should be at least $3,000 a year, so that good men may be secured for the positions. The loss of time by officers and others, the prolonged incarceration of persons who may later prove their innocence, and the crowding of men and women of all kinds in patrol wagons is demoralizing and inhuman. Women and children at the house of detention should have speedy trials at that place and so be free from the bad influences following transportation to the police courts and temporary detention there.

Lastly, the Major recommends that the sale of opiates should be restricted. He reports that the spitting on sidewalks has been much abated by the regulation against the habit.

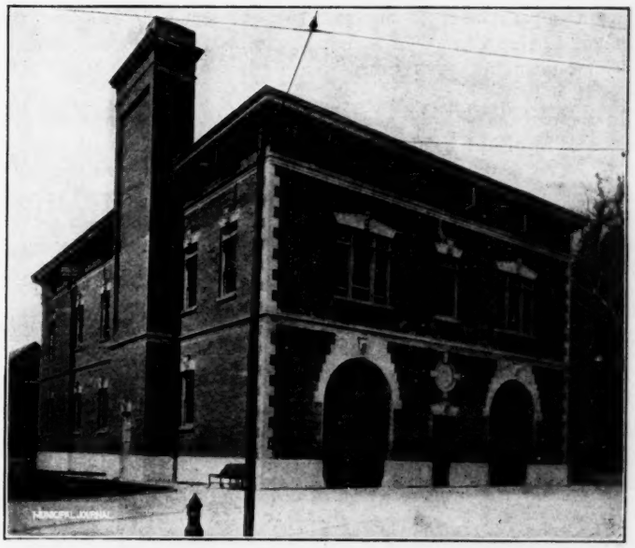
One of Philadelphia's New Fire Station

WE are indebted to Chief Baxter, of Philadelphia, for a description of the new engine house shown in the accompanying illustration.

This fire station was designed by Philip H. Johnson, architect, of Philadelphia, and built by Hiram Miller. It is without exception one of the best constructed and artistic fire stations in the city of Philadelphia, the lot being especially adapted for fire station purposes.

The house has a frontage of fifty-two feet, four inches, and extends eighty-three feet to the rear. It is three stories in height, of ornamental modeled brick, with lime-stone trimmings.

On the first floor there's an engine, hose-wagon and truck with



FIRE STATION NO. 9, PHILADELPHIA, PA.

stall accommodations for seven horses. These stalls are equipped with patent stall floors and drained directly to the sewer. This being one of the first houses so equipped in the city. The object in draining the stalls was to avoid, if possible, any odor arising to the dormitories above. This was accomplished after a great deal of study, and the house is entirely free from odors generally encountered in buildings of like character.

The second floor, which may be termed the firemen's living rooms, is furnished in the most elaborate style. In the front is the sitting room; here the men spend their idle moments waiting an alarm of fire. From this room are two brass sliding poles to the first floor.

Immediately back of the sitting room are Fireman Louis Roop's rooms and bath, on one side; on the other, the lockers and toilet rooms. These latter are novelties in the plumbers' line, having all the latest sanitary improvements, shower and bath tub, etc. In the extreme rear the main dormitory is located with ample accommodations for seventeen men. It is finely upholstered. In the attic there is room for feed, etc., and ample space for a gymnasium.

Fire Department of Jamestown

THE first volunteer fire department of Jamestown, N. Y., was organized back in 1829, and the history of the organizations that followed up to the one that protects the property of the citizens at the present time is an interesting one. In the original act of incorporation of the little village of Jamestown in 1827, provision was made for the organization, equipment and maintenance of a fire department. But the old-timers did nothing hurriedly, and the trustees took the trouble to call a public meeting of the citizens that all the

OLDEST FIRE-ENGINE IN NEW YORK STATE

tax payers could have a chance to talk on the project. It was finally decided to raise $300 by taxation for fire protection, but two years passed before the first fire company was formed, with Ellick Jones as captain.

An illustration is given, showing the old engine that was purchased August 7, 1829, at the time of the formation of the fire department. It is a type of the engines built in the early '20s, but are often erroneously supposed to have been built back in the previous century. It is simply a little red wagon hand pump and was named the "Active." The first company formed was at that time called "Fire Company No. 1," but has been subsequently renamed the "Deluge Engine Company," and claims to be the oldest fire company in Jamestown, although others have attempted to wrest its title from it.

In comparison with this old fire fighter is shown the new steamer that was furnished by the La France Engine Company, of Elmira, N. Y. The department grew with the growth of the village, until now there are one hook and ladder company, a fire police and salvage company, six hose companies, one of which is equipped with a Holloway combination chemical engine and hose wagon, and a steamer company having charge of the La France engine mentioned above.

JAMESTOWN'S LA FRANCE STEAM FIRE-ENGINE

There is an extra hook and ladder truck in reserve. All the apparatus is equipped with horses, and every bit of it is of modern type. There are thirteen paid men and 224 volunteers, under the leadership of Chief Fred. H. Wilson, who was appointed to the position by Mayor Cooper in 1898, after serving two years as assistant chief. Chief Wilson served during the Spanish-American war in the 65th New York Volunteer Regiment, being promoted to a first lieutenancy in 1898. He is now first lieutenant of the 13th Separate Company, N. Y. N. G. Leonard F. Jones is the assistant chief, Clement B. Jones is secretary and Morgan B. Kent treasurer of the department.

The annual report of Chief Wilson for 1902 gives the population of the city of Jamestown as 26,000, the area at nine square miles and the number of buildings of all kinds at 5,778. During the year the department responded to forty-one alarms. The total valuation involved in fires, on which claim for loss was made, amounted to $363,000, and the total insurance, $243,666.66. The total loss was $9,459.99, of which $8,561.39 was insured.

Dublin Mounted Police

THE Dublin Metropolitan Police is a body quite distinct from the Royal Irish Constabulary, and has its origin in the early part of last century. So far back as 1808 Dublin was formed into a district called the "Police District of Dublin Metropolis," but it was not until 1836 that, after several changes, the Police system of the "dear, dirty" city was put on a sound footing of organization and administration, the lines being followed of the London Metropolitan Police Force as established by Sir Robert Peel's Act of 1829. One can imagine that the early days of the Dublin police were rather tempestous, as it is hardly to be supposed that the average Irishman took kindly at first to the organized maintenance of law and order in the capital. But doubtless the antipathy soon wore off, as much as it ever will wear off, and largely because the Irishman probably makes, all things being considered, the finest policeman in the world.

In the first place the Irish policeman is habitually as plucky, and generally as finely built, a man as one could wish to set eyes on. In Dublin there are some truly splendid specimens of brawn and muscle to be seen in police uniform; while in any case in which order has to be maintained or restored by the exhibition of sheer fighting courage on the part of a single man in the midst of an angry crowd, an Irish constable seldom if ever regards mere crushing odds as anything but an incentive to vigorous action. The police in America, who have to deal with some of the toughest elements of disorderly humanity it is possible to conceive, are largely Irish, and some stirring tales are told of their devotion to duty in circumstances quite murderously perilous for an isolated individual.

But perhaps the Irishman's best qualification for constabulary duty is the national character, which is so conspicuously full of humanity, generosity, and humour. Many a time has a serious row been averted in the streets of Dublin by the capacity of the police to take a kindly and even humorous view of a situation in which a British constable—unsurpassable in his own elements—would act with such drastic vigour as to provoke terrible resentment, or the French *gens d'arme*—to take a very different type—would rage, like the heathen, furiously, and end by producing innumerable *pièces de conviction* against perfectly innocent persons.

During the latter part of the nineteenth century the Dublin Metropolitan Police were further assimilated by various statutes to the London Metropolitan force, and they continue to be worked as far as possible, on the same lines. The Dublin Metropolitan Police are immediately controlled by a commissioner and an assistant commissioner, the offices of receiver and secretary being consolidated. Every year the commissioner reports to the Chief Secretary for Ireland, and gives full statistical information regarding the force and the crimes with which it has been called upon to deal. According to the returns there were at the beginning of last year in the Dublin Metropolitan Police seven superintendents, twenty-four inspectors, thirty-four station sergeants, 143 sergeants, and 990 constables, the effective strength being 1,142 of all ranks. The area of the Dublin Metropolitan District is a little over thirty-two square miles, which is less than one-twentieth of the area of the London Metropolitan District, the latter being controlled by about 14,000 of all ranks.

The Dublin mounted police are a very fine and admirably mounted and equipped body of men, smart in appearance, and possessing, it may be added, qualities besides smartness which are of peculiar service to them in their duties. A mounted policeman's work in a great city is by no means confined to the easy job of sitting on a horse at some convenient point during a great open-air function, and there is much of it which the best of soldiers, without special experience, would probably come to grief in attempting to do at once smartly and effectively. Indeed, the very best sort of mounted policeman is a combination of knowledge and capacity which makes him very well worth the not extravagant pay he draws from the public purse.

In Dublin there is probably less difficulty than in any other European capital in finding a policeman who can ride, for the fondness of the average Irishman for a horse is proverbial, and there are few better riders of all classes than are to be found in the Irish huntingfield.—*Army and Navy.*

WHAT POLICE AND FIREMEN ARE DOING

Louisville Firemen Disgrace the Service—Politics Bad for Fire Department—Ordinance to Regulate Storage of Oil—Fire and Police Personals

More Pay for Montreal Firemen

An increase in the pay of the Montreal, Can., firemen was recommended to the Council of that city by the Fire Committee. An increase in the number of men was asked by Chief Benoit on the ground that the city was growing rapidly and the work of the department was getting heavier. Firemen serving their first year are recommended for $550 per annum; second year men for $625, and all over two years are to get $700. Foremen are to receive $750, an increase of $50; engineers, $800, instead of $735; captains, $1,100, instead of $1,000. The sub-chiefs are also included in the increase, and will, in the future, receive $2,000, uniforms and horse-keep included, as compared with $1,850, as at present.

Louisville Firemen Loot

A most disgraceful state of affairs existed in the Louisville Fire Department recently when wholesale looting was done by the firemen at a large fire in the Masonic Building. It was claimed by witnesses that, before attending to their duties, firemen stopped to try on shoes in a store which the fire had not reached, and broke open desks, money-drawers and trunks of the actors in a theatre. A large amount of goods was stolen and, as no one but the firemen entered the building after the fire started, the proof was easily secured. Chief Fillmore Tyson and Mayor Grainger were determined to punish the guilty and a thorough investigation was made. Many of the stolen articles were found in the different engine houses hidden away in the beds or lockers of the men. Three members of the Department were dishonorably discharged for looting and seven for refusing to testify. Charges were preferred against sixteen men, but six were acquitted. It is unfortunate that the dismissed men were not prosecuted, as dismissal was but light punishment for the looting.

Fire Loss in Several Cities

From a list representing the fire losses in the large cities in the United States, as compiled from the statistical report of the National Board of Fire Underwriters, the loss from fire in Charleston, S. C,. during the past year appears to be one of the smallest of any of the larger cities. The per capita loss in that city is placed at 58 cents. There were only about a dozen cities that had a smaller loss. Of these there are only a few cities of Charleston's size and population, which makes the showing all the more creditable and reflects much credit upon the city's fire department. Against the small loss of 58 cents per capita in Charleston are the following comparative figures of other cities, taken from the same source: Atlanta, $4.74; Augusta, 67 cents; Columbus, $19.54; Macon, 91 cents; Birmingham, $8.58; Mobile, $5.08; Montgomery, $2.78; New Orleans, $2.08; Jacksonville, $2.52; Chicago, $2.19; Kansas City, $1.18; Boston, $2.88; New York City, $2.13; Washington, 49 cents; Syracuse, $2.53; Philadelphia, $1.66; Pittsburg, $1.70; Chattanooga, $3.62; Knoxville, $9.52; Memphis, $4.33; Nashville, $3.77; Galveston, 23 cents; Richmond, $3.28; Wilmington, $1.23; Charlotte, $1.05, and Savannah, 99 cents.

A number of papers have taken this up in comparison with their loss per capita. The Houston Fire Department has done excellent work in the past year and in comparison with the total valuation of property involved and the large area of ground to cover, deserves much credit. The total damage to buildings and contents by fire was $62,232.45. Houston has a building inspector who receives a regular salary monthly, and, besides him, the chief, assistant chief and members of the fire department all make inspections in order to more fully acquaint themselves with their surroundings in case it becomes necessary for them to have to fight fires. The manual force of the department consists of fifty-nine to sixty men. The apparatus consists of two combination chemical and hose wagons, seven steamers, one chemical engine, five hose wagons, one hook and ladder truck, one aerial ladder truck, chief's buggy, assistant chief's buggy and one hose reel held in reserve.

Pittsburg Politics Damage Fire Alarm System

The inexperienced employees that had charge of the Pittsburg fire and police alarm telegraph got the system into such a demoralized state that it was necessary to send for Superintendent Elmer G. Loomis, of the Allegheny Bureau of Electricity, to straighten things out. For several weeks the entire system had been out of order, and neither Superintendent John A. Herron nor his assistants could remedy matters. Mayor Hays, of Pittsburg, then called for assistance from Mayor Wyman, of Allegheny, who sent his superintendent over the river. The latter, being an experienced man, took charge of the system in Pittsburg, and soon had things in working order again. This is but an instance of the trouble that comes from replacing experienced men with incompetents, and amounts almost to a crime in a position of such importance to the safety of the lives and property of citizens as is that of superintendent of police and fire alarm telegraph.

Firemen Keep a Menagerie

Nearly every fire company has a mascot of some kind, the usual kind being a little yellow dog that has been adopted by the firemen because it lacked a home. But Chemical Engine No. 1 of Savannah, Ga., prides itself on a well stocked menagerie in which are a variety of mascots. In the rear of the engine house is a double row of cages in which are animals from all over the world. The menagerie was the result of ten years' collecting on the part of Robert Glass, a member of the company, who also owns the animals. The collection consists of four monkeys, eighteen squirrels, ten guinea pigs, a hawk, six alligators, fourteen terrapins, a raccoon and a lot of gold fish.

What Constitutes a Good Policeman

In speaking of the qualities that make a good police officer, Police Marshall T. F. Farnan of Baltimore, Md., is quoted as saying: "A policeman occupies a position of responsibility, and, naturally, he should set an example of clean living. But to get down to actual police requirements, beginning with the physical ones, first of all a police officer should be a man of good physique. This does not mean that he ought to be a giant in stature or have muscles like Sandow, but the more athletic he is the better. He should have a constitution that is not sensitive to extreme heat or cold, for in performing police work he will be exposed to all kinds of weather, nearly all of his working hours being spent out of doors.

"He should be temperate. People can say what they will, but close observation has convinced me that the man who does not indulge in liquor as a beverage or a stimulant has more endurance, can act quicker in an emergency and can be more cool-headed under great provocation than the man who drinks, even if he only takes one or two drinks a day. One quality that all police officers should possess is the ability to say 'No' and to stick to it, and this quality in one of its phases is closely connected with the matter of being temperate."

To illustrate what he meant Marshall Farnan went on to show that, after an officer has accepted drinks from a saloon keeper, he is naturally under obligations and so will not hold the saloon man up to the law. Thus, he is not only protecting law-breaking, but also is violating his oath as an officer and the regulations of the Department by drinking while on duty.

Butte's Fire Department in Good Condition

DURING the past year the Fire Department of Butte, Mont., responded to 183 alarms, not one of which was false. This speaks well for the citizens of that city. The loss by fire amounted to $42,089, or a little over 3 per cent. of the total amount of property involved. In addition to the water used in extinguishing the fires, some 1,872 gallons of chemicals were used. The apparatus was in good condition at the time of Chief Peter Sanger's report and consisted of two hose wagons, a Champion combination hose and chemical wagon, a Champion eighty-gallon chemical engine, two hook and ladder trucks and a buggy for the Chief. In reserve are held a hose wagon and hose reel. The hose in service consists of 11,650 feet of two and one-half inch cotton and rubber hose. There are fifty-eight alarm boxes in service, run under the Gamewell system, and the police patrol system is also under the charge of the Fire Department and is of Gamewell manufacture. No apparatus was purchased during the year, but a number of repairs were made and 4,000 feet of hose bought.

During the year each of the three stations was fitted with hand-ball courts for the use of the men. This work was paid for by the men themselves. Chief Sanger reports that the water supply was entirely satisfactory both in quantity and quality, and the hydrants were always found in good condition. This was accounted for by the fact that both the Fire Department and the Butte Water Company make frequent inspections.

The Chief recommended that the ordinances be amended in regard to electric wiring, as there were some fires due to defective wiring. He also asked for a new buggy and harness and that two men be added to the force on account of the extension of the city's limits.

Ordinance Regulating Storage of Oil

AFTER the first of January 1904, the Council of Charleston, S. C. has decided that it shall be unlawful for any one to store or keep more than 100 gallons of refined petroleum or other inflammable oil of not less than 100 degrees flash test. All of these oils must be kept in close metal tanks or vessels and must not to be drawn or handled by artificial light. Refined petroleum or the like may be stored in cellars, when buildings are not occupied as dwellings or sleeping apartments, in quantities not exceeding ten barrels upon obtaining a certificate from the chief of the fire department. Not more than ten barrels of gasoline, benzine or naphtha shall be stored in any one building. Such quantities of these materials as recommended by the chief of the fire department and the mayor, but not to exceed 250 gallons above, or 1,200 gallons under ground, may be stored in any building provided the latter is ten feet distant from any frame building or dwelling house and provided that the materials be kept in fire-proof vaults in which all openings are covered with metal shutters and that the said materials shall not be handled or drawn in artificial light or at night.

Refined petroleum or other inflammable oils of not less than 100 degrees flash test and not exceeding 700,000 gallons in amount, and gasoline, benzine and naphtha not exceeding 25,000 gallons, may be stored in tanks under certificate of the fire chief showing that there is a clear space of 300 feet between the tank and any building unless building belongs to owners of tank when the space may be 200 feet, but 100 feet must intervene between this building and any other. Tanks must be surrounded by an embankment between four and six feet high and with a crown of three feet and forming a reservoir, the capacity of which is at least one and one-half times that of the tank.

A distributing plant to hold twenty-five empty, fifty full barrels of oil, a tank of 16,000 gallons of refined petroleum, and a tank of 8,000 gallons of gasoline, benzine or naphtha may be established if the plant be surrounded with fire walls twelve inches thick and twelve feet high and the openings in the wall be twenty-four inches above ground. A watchman must be employed during the night hours and the chief of the fire department must make monthly inspections. Oils above specified must not be landed where other merchandise is stored. A fine of $100 a day is the penalty for violation of this ordinance.

Fire and Police Personals

—Henry Stein has been chosen head of the fire department recently formed at Elm Grove, W. Va.

—A. E. McCollum, an attorney of Topeka, Kan., was appointed chief of police by Mayor Bergundthal to succeed Chief Carl Goff. The main reason for Chief Goff's dismissal was the fact that he failed to close the "joints" of the city.

—Robert A. Giller, former chief of the South Milwaukee Fire Department, died on November 29th. He instituted the fire, water and sewer systems of the city and was at the head of the Fire Department from its inception until two years ago. He was first vice-president of the Wisconsin State Firemen's Association.

—In a letter to the Council of Harrisburg, Pa., Chief Lutz, of the Fire Department, called attention to the filthy condition of the water in the hydrants and the danger to the fire engines in using it because of the stones and gravel that are often encountered. He also asked that good engineers be employed to run the engines, as there was great danger to the machines if placed in charge of inexperienced men.

—At the recent election of officers for the Fire Department of South Norwalk, Conn., Luther M. Wright was selected for the position of Chief. Messrs. Albert E. Winchester and Rufus J. Smith were elected First and Second Assistants, respectively, by acclamation. They are old firemen; Chief Wright is a Councilman and manufacturer, Mr. Winchester is general superintendent of the municipal electric light plant, and Mr. Smith is a manufacturer and former councilman.

—The new officers for the recently organized paid fire department of Atlantic City, N. J., will be: Chief, William Black, a former member of the Philadelphia Fire Department, and Assistant Chief, George Cluin, an officer of the Atlantic Fire Company No. 2. Ex-Senator Lewis Evans was first named for Chief, but positively declined to serve, and so William Black, at first named for Assistant Chief, was appointed. Every member of the volunteer department was appointed to the paid department. The uniform of the New York department was adopted.

—Chief Benjamin Murphy, of Jersey City, N. J., took occasion, recently, to address some union pickets who had been arrested for interfering with non-union men. He told them that, in Jersey City, people engaging in honest employment would be protected whether union or non-union, and if anyone annoyed them, he would be arrested. The Chief believes in preventing crime, or a breach of the peace, and considers that when strikers loiter around and try to intimidate or annoy workers, they are disorderly and should be arrested. Chief Murphy is not a blusterer, but means what he says and carries out the law without regard to who is involved. He is a chief of whom Jersey City should be proud.

—On December 1, Chief Charles D. Purroy, of New York Fire Department, on his own motion, retired from office, and Deputy Chief Charles W. Kruger was made acting chief. The change in the city administration was, no doubt, the reason for Chief Purroy's retiring after nearly a year in the position of Chief. If the Low administration had been re-elected in November, it is not likely that the Chief would have retired at this time. Chief Purroy has a record of having made no mistakes during his encumbency in office and he succeeded in bringing the department out of the state of confusion into which it had fallen in the last few years because of poor management. Like all good leaders, Chief Purroy disliked display and went quietly about his work, and the public was not conscious of it except by the results he secured. One of his last recommendations was that the railroad authorities should be compelled to provide circuit-breakers so that the current could be cut off from the third rail in the localities where a fire existed. Either telephonic communication should be established between the power house and each station of the elevated road so that word could be sent at once, or each station should have circuit-breakers to cut out sections on which the firemen were working. Each member of the engine companies should be equipped with rubber gloves to use in handling hose on the elevated structures.

LITERATURE ON MUNICIPAL TOPICS*

Reviews of Some Important Books—What the Magazines and Reviews Have to Say About Civic Affairs—Municipal Reports Received

Books

Home Mechanics for Amateurs, by George M. Hopkins, deals with a large number of experiments that may be made by amateurs and also contains practical instructions how to work in wood and metal and make model engines, boilers, meteorological and electrical instruments, telescopes, dynamos, motors, etc. It is not a boy's book, but appeals to the more mature amateur experimenter and contains information for all who use tools. Cloth, 370 pages, 320 illustrations, $1.50 s. a.

♣

One of the best works devoted to interurban electric railways is W. C. Gotshall's *Notes on Electric Railway Economics and Preliminary Engineering.* This book is based upon a series of lectures, the subject of which dealt with the economics of the preliminary determinations and of the construction and operation of high-speed interurban electric railroads. Part of the book is devoted to a statement of the principles which should be followed in locating a proposed route so as to derive the maximum benefit from the territory to be served. The considerations pointed out are new and important. The data relating to the determination of the probable cost of construction and of the mooted question of train resistance are very complete. The author has placed at hand a method of accurately determining the costs of operation for almost any proposed system, and points out the fallacy as well as danger of using the percentage of gross receipts method now so commonly employed.

There is in Chapter X an excellent discussion of third rail vs. trolley systems, showing the applications and limitations of each. The book concludes with a set of complete specifications for the construction of a moderate sized high-speed interurban electric railway operating over its own right of way. Cloth, 252 pages, price $2 net.

♣

The Tariff Problem, by W. J. Ashley, is a discussion of the question of the day in England—whether that country is to depart from its old policy of free trade and adopt a new one of either moderate or high protection. The author declares that the only way to settle the question is to weigh carefully the facts as they are now with a view to the future. Because free trade has done well for a long period, it does not by any means follow that it is the best under present economic conditions, and this idea is being appreciated by such men as former Colonial Secretary Chamberlain. As a German economic leader says, "tariffs are economic weapons," and the author shows that they should be employed by England to secure for itself the best conditions possible from other countries, and, showing preferences to her colonies, bind the latter to her closely. He warns that, unless some such means can be devised to make a common interest between the colonies and the mother country, the British Empire is bound to break up. The component portions will look to other countres for privileges and preferential policies, and he holds that England should be the first to try what can be done at making an amicable bargain. Price, cloth, 210 pages, $1.

♣

THE report of the ninth annual meeting of the *National Municipal League* and of the eleventh national conference for good city government held at Detroit, Mich., last April, has been issued. The proceedings of the convention are given, and in the appendix the papers read at the different sessions. These were: "The Meaning and Importance of Nomination Reform," by Horace E. Deeming; "The Year's Work," by Clinton Rogers Woodruff; "The St. Louis Disclosures," by James L. Blair; "The Minneapolis House-Cleaning," by William A. Frisbie; "Municipal Situation in Wisconsin," by Dr. Amos P. Wilder; "The Municipal Situation in Detroit," by Sherman D. Callender; "The Municipal Situation in Chicago," by Frank H. Scott; "The Municipal Situation in Indianapolis," by Charles C. Brown; "The Municipal Situation in Ohio," by Harry A. Garfield; "The Municipal Situation in San Francisco," by Frank J. Symmes; "Municipal Government in the Philippines," by Dr. Paul S. Reinsch; "The Federation of Civic Forces," by J. Horace McFarland; "The Federation of Civic Societies," by Charles C. Brown; "Instruction in Municipal Government," by Prof. John A. Fairlie; "The Teaching of Municipal Government in the High Schools of Our Large Cities," by J. B. Davis; "The School City," by Wilson L. Gill; report of the Committee on Uniform Municipal Accounting and Statistics, by Dr. Edward M. Hartwell; "Chicago Accounting Reform," by Frederick A. Cleveland, Ph D.; "Progress of Uniform Municipal Accounting in Ohio," by Harvey S. Chase; "What Has Been Done Toward Uniform Accounts for Street Railway, Electric and Gas Lighting, and Water-Works Systems," by M. N. Baker. The report contains 324 pages and an index and forms a collection of literature in the municipal field that will be of permanent value.

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The Purification of Sewage and Water. By W. J. Dibdin. The latest English work on sewage disposal. Cloth, 379 pp., numerous tables and figures, price $6.50 net. v.

♣

Testing of Road Materials. By Logan Waller Page, chief of the Road Material Laboratory, Washington, D. C. Paper, 77 pp. Published by the U. S. Department of Agriculture, Washington, D. C.

♣

The Care and Handling of Electric Plants. By Norman H. Schneider. A book for those having little experience in this line. s.

♣

The Industrial Uses of Water. By H. De La Coux. Translated from the French by Arthur Morris. Cloth, price $4.50.

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Periodicals

Insurance Engineering for November contains a short article on *Local Fire and Building Ordinances* presenting the ordinances in this line in effect in Glen Falls, N. Y. Henry A. Fiske presents *Automatic Sprinklers and the Fire Department,* in which he asks if fire departments understand and appreciate the value of sprinklers and their power of extinguishing fire. He suggests that members of departments study the sprinklers so as to be able to co-operate with them to the best advantage. New York, N. Y. Price per year $3.

♣

In the December *Arena,* Eltweed Pomeroy, president of the National Direct Legislation League, talks of *The Failure of Representative Government,* showing how secondary is the public interest in many State legislatures. Hon. Harris R. Dooley, Director of Public Charities, Cleveland, O., contributes *Criminal Treatment of Crime,* in which he points out the wrong of sending many to prison for trivial offences and thus making criminals of them. This is especially true of young boys and the juvenile court is going to do away with the wrong in their direction. New York, N. Y. Price per year $2.50.

♣

San Francisco Under a Labor Mayor appears in *The World To-Day* for December, by Francis John Dyer. The author tells how the labor interests of the city formed a party and elected Mayor E. E. Schmitz over both the Democratic and Republican nominees and how the Mayor cleaned out most of the city departments which, in the case of the Board of Public Works, was handicapped by too much red tape to be effective. He also shows how the Mayor made enemies of the Board of Supervisors, and so made a good deal of trouble. The administration was fair, although not without mistakes, which were due to ignorance and inexperience or to bad or self-interested advice. The Mayor did not permit disturbances by the striking laborers as was predicted by conservative citizens before his election. His administration has been conservative and, as he

* Any book or periodical reviewed or mentioned in THE MUNICIPAL JOURNAL, or elsewhere, will be sent to any address on receipt of price.

has been re-elected, it is hoped his good work will be continued. Chicago, Ill. Price per year $3.

Yonkers; the Awakening of a Smaller City, by Mary Marshall Butler, is an account of how the authorities co-operated with the Civic League of the Woman's Institute in investigating the conditions in the tenements where 80 per cent. of the population reside. A committee was appointed to frame a tenement house law and, taking the law of New York, worked out a law suitable to Yonkers. This report of the committee was laid before the Council, where it still remains. Another article in this issue of *Charities* for December 5, is on on *Kingley House, New Orleans,* by Eleanor McMain. In *Charities* for November 28 appears the discussion in the Massachusetts State Conference on *Tramps.* New York, N. Y. Price per year $2.

The Proceedings of the American Society of Civil Engineers for November contains an article on *The Breakwater at Buffalo, N. Y.,* by Emile Low, and discussions on papers previously presented, including *The Fatigue of Cement Products, and Filtration of Public Water Supplies, with Especial Reference to the Double Filtration Plant at Bremen, Germany.* New York, N. Y.

A survey of *The Character of the New York Public Schools,* by Miss Adele Marie Shaw, appears in the December issue of *The World's Work.* Miss Shaw spent many days visiting the schools of the Greater City and found that there was a great difference in them. Some of the newer ones were models of what modern schools should be, while in some of the older buildings the worst possible sanitary conditions prevailed. In some of the school rooms it was necessary to burn gas all the day long, and other sanitary conveniences were conspicuous by their absence. She found that a great deal depended on the character of the principal whether the children were taught in accordance with modern or were subjected to the old style methods of strict discipline and learning by rote. Her conclusions are stated at the end of the article and are, in substance, that New York's educational problem is the most difficult in the country, and is in a class by itself; under the present school administration wonderful work is being done to solve the problem; conditions place the complete solution beyond any normal effort and expense; the only remedies are restriction of immigration and a vast increase in expenditure. New York, N. Y. Price per year $3.

Wage-earning Children. Municipal Journal, London, Eng., Nov. 20.

"Carrington House," Deptford. London County Council's New Lodging-house for Men. Municipal Journal, London, Eng., Nov. 20.

Unclean Milk, Bovine Tuberculosis and the Tuberculin Test—Their Relation to the Public Health. E. R. Larned in *Boston Medical and Surgical Journal* for Nov. 28.

Tuberculosis and Consumption. Lawrence F. Flick in *Current Literature* for December.

The Metropolitan Asylum's Board and the Treatment of Consumption. The Lancet, London, Eng., November 21.

John A. Riis, on the New York City Election. The Churchman, New York, Nov. 21.

New York—A City of Power. Hamlin Garland, in *The Metropolitan,* New York, for December.

The Control of the Householders in Sanitary Matters. Marion Talbot. *House Beautiful* for December. Chicago, Ill.

The Homes of Workingmen. Augustus Bridle in *Canadian Magazine* for November.

The Crusade against Consumption. Irving Fisher in *The Outlook* for November 21, New York.

Electrolytic Damage to Water Mains at Richmond, Va. Engineering Record, New York, November 7.

Incandescent Gas Lighting in French Cities. G. Jouanne, *Journal of Gas Lighting,* London, Eng., November 3.

Municipalization of Gas and Electric Plants. A report of a committee of the American Gas Lighting Association. A technical and statistical article. *Progressive Age,* New York, Nov. 16.

A Unique Municipal Crusade. Campaign waged by New York health officials against contagious eye diseases, trachoma, in New York schools. Francis Weston Carruth, in *North American Review* for December.

New Municipal Gas Works at Stafford, England, Journal of Gas Lighting, London, Eng., Nov. 3.

What to Do with London's Unemployed. Canon Barnett in *Economic Review,* London, Eng., for December. Not deterrence but education to make people work.

The Cedar Grove Reservoir of the Newark, N. J., Waterworks. Part I. A general description, dams and contractors' plant. *Engineering Record,* Dec. 5, New York.

The Glasgow Municipal Telephone System. A serial beginning Oct. 9 in the *Electrical Review,* London, Eng.

Mechanical Road Vehicles. W. Worby Beaumont. A serial beginning Oct. 16 in *Journal, Society of Arts,* London, Eng.

Some Observations on Street Pavements. S. Whinery, C. E., in *Engineering News,* New York. Serial beginning Oct. 22.

Difficult Street Intersections. Engineering Record, Oct. 24, New York.

The Design of Works for the Bacterial Treatment of Sewage. Stuart H. Davies, *Engineering,* London, Eng., Oct. 9.

The Disposal of New York's Refuse. Scientific American, New York, Oct. 24.

Baltimore's System of Garbage Disposal. Scientific American, New York, Oct. 31.

Perviousness of Sewers, A. P. Folwell, *Engineering Record,* New York, Nov. 7.

Relative Strength of Wet and Dry Concrete. James W. Sussex. *Cement and Engineering News,* Chicago, Ill., for October.

Sound and Unsound Portland Cement. Cement and Engineering News, Chicago, Ill., for October.

Concrete Reinforcement. Julius Kahn, C. E., *Engineering News,* New York, Oct. 15.

The Flow of Water in Long Pipes. George M. Lawford, C. E. *Minutes of Proceedings,* Inst. C. E., London, Eng., Vol. 153.

Significance of Bacteriological Methods in Sanitary Water Analysis. C. E. A. Winslow and C. P. Nibecker in *Technology Quarterly,* Boston, Mass., for September.

Some Sources of Errors in Water Treatment. H. Spencer Flynt in *Engineering Magazine,* New York, for November.

A Small Open Sand Filter at Reading, Pa. Engineering Record, New York, Nov. 7.

Latest Progress in Road Construction. Waldon Fawcett. Description of improved road machinery with illustrations. *Scientific American,* New York, Oct. 3.

Testing Methods in the Physical Examination of Portland Cement. A. H. Cederberg. Results of tests and methods used in 6,238 tests. *Mining and Scientific Press,* San Francisco, Cal., Oct. 3.

A British View of the Bacterial Treatment of Sewage. Dr. Samuel Rideal. *Engineering News,* New York, Oct 22.

Sand Washers at the Roxborough Filters, Philadelphia. Engineering Record, New York, Oct. 10.

Municipal Reports Received

We have received the annual reports of the city of Ogdensburg, N. Y., including the report of Mayor George Hall.

We are indebted to Mr. William F. Connolly, secretary of the Police Department of Detroit, Mich., for the thirty-eighth annual report of that department.

The eighth annual report of the Public Lighting Commission of Detroit has been received.

Mr. A. Coleman, manager of the Municipal Lighting Plant at Taunton, Mass., has favored us with his last annual report.

The annual report of the Park Department of Cincinnati, O., for 1902, has come to hand.

We have received the fourteenth annual report of the Commissioner of Parks and Boulevards of Detroit.

The report of the Superintendent of Street Cleaning of the District of Columbia for 1902-3 has been received.

Mr. Robert R. Evans, city engineer of Haverhill, Mass., has sent us his annual report for 1902.

REVIEW OF MUNICIPAL REPORTS

Salt Water for Sprinkling—Lighting Rates in Wilmington—Hand Patrol for Street Sweeping Satisfactory—Meters Do Not Restrict Bountiful Water Supply

Cost of Lighting Wilmington

UNDER the subject of "street lighting" in the report of the Street and Sewer Department of Wilmington, Del., it is stated that the number of arc lamps in use on February 1 last was 298 and that these cost $64.92 per lamp per year. The number of incandescent lamps amounted to 516 and cost $14.88 per lamp. The Welsbach Street Lighting Company of America, furnished 695 incandescent gas lamps of fifty candle-power which, burning on an every night all night schedule, cost $26.75 per lamp. From June 3 to July 24 the American Lighting Company, Ltd., furnished 521 plain gas lamps at ninety cents per 1,000 feet and from the latter date to January 31, this company supplied incandescent gas lamps at $25.75 per lamp.

Plenty of Water at Low Rates

ALL the water services in the city of Covington, Ky., are metered and the Commissioners of the City Water Works repeat in their annual report what has already been said about the use of water meters, namely, that "They do not restrict a legitimate and bountiful supply of water for necessary purposes, but plenty of it from a sanitary standpoint." The minimum allowance per month is 2,680 gallons and the price charged but 50 cents. The only restrictions are against careless waste and leaks in services. They consider that paying for water through meter measurement is the only fair way for, if consumers are careful, the bills are small; if wasteful, the bills are large in proportion. The Department furnishes free water to a number of public and charitable institutions for which no credit is given, the value of the water being estimated at $10,000 a year. While the revenues do not afford a profit above running expenses and interest on the bonded indebtedness, Mayor W. A. Johnson aptly points out that plenty of water is supplied at very low rates and any apparent deficiency is met by a general tax instead of higher rates which might become prohibitory

Improvements in Kansas City

THERE has been a considerable falling off in the work of public improvements in Kansas City, Mo., during the past fiscal year. Only about half the amount of paving was done as compared with the year previous. During 1902-3 there were laid 1.98 miles of brick, 0.11 miles of macadam, and 8.28 miles of asphalt. In 1901-2 16.55 miles of asphalt were put down. At the present time there are 115.05 miles of asphalted streets in the city, 39.55 miles of brick, 2.24 miles of granite block, 35.83 miles of macadam, and 0.46 miles of cedar block, giving a total of 183.13 miles of paving. City Engineer Pike also reports to the board of public works that 31.97 miles of artificial and natural stone, brick, and plank walks were laid, as well as 22.66 miles of sewers. There are over 460 miles of paving under contract.

Street Cleaning in Somerville

STREET COMMISSIONER JOHN P. PRICHARD, of Somerville, Mass., reports that the demand for cleaner streets is constantly increasing, and that the patrol system of freeing the streets from rubbish, waste paper, etc., has given great satisfaction. To take care of streets in this manner, four sweeping machines, one Barnard Castle scraper, two Mentzer street cleaners and nine small hand carts are kept in service. An assistant looks after the watering of the streets, which is done by contract. The uniform price of $80 per month for carts is paid each contractor, and there are 28 carts in service, each looking after a district which averages about two miles of streets.

A stone crusher has been kept continuously at work, breaking 16,000 tons of stone. During the year 174 trees were set out, a number removed, and wire protectors placed on fifty-six. The department has in service two Buffalo Pitts rollers, and one five ton asphalt roller.

Recommends Granolithic Sidewalks

THE board of public works of New Bedford, Mass., was abolished in July of last year, and the control of the departments passed into the hands of the city council. Superintendent of Streets C. F. Lawton reports an increase in the cost of the work; thus, for concrete walks, the price has risen from 54 cents in 1901 to 73 cents in 1902. The city's price for concrete was 50 cents per yard, but he recommends that it be raised to 75 cents. He calls attention to the advantages of granolithic for sidewalk construction, stating that it is better and less expensive than flagging, and more economical than concrete. He states that in many streets a four and one-half foot granolithic walk would be ample for all travel, and would permit of space for trees and grass plots. As compared with a nine and one-half foot concrete walk, the four and one-half foot granolithic walk would cost 84 cents as against 77 cents for the concrete walk.

Despite the steady increase in the cost of street cleaning, the superintendent declares that the streets are not kept clean. Much of the dirtiness of the streets could be prevented if the citizens would cooperate with the department. A greater use of ash barrels or rubbish cans would keep from the streets a large portion of the litter that now disfigures them.

Recommends Salt Water Sprinkling

THE Water Board of Atlantic City, N. J., urges the desirability of using salt water for street sprinkling, thus cutting off all unnecessary waste of fresh water. It also urges the necessity of controlling the sources of pollution on the water sheds and asks the Council to make provision for these two things. The Board in 1902 had an ordinance passed by the Council for the purpose of preventing damage to the water mains by electrolysis from the electric railways in the city. Water Works Engineer Kenneth Allen recommends that the water shed should be regularly inspected so that all cause of contamination could be removed. He also asks that means be taken to reduce the color of the water, which is due to contact with the cedar growth on the water shed. No ill effects are known to have come from this color and the water in which it occurs is little liable to decomposition, so that there is a small amount of vegetable matter in the solution, but the citizens object to drinking the water and therefore it is advisable to remove the color. Tests show that the number of bacteria per cubic centimeter runs between one and two hundred, which is very low for surface water. Few *bacillus coli* have appeared from time to time, and on this account means should be taken to filter the water. There is but little typhoid fever in the city, in 1902 there being but eighty-three cases, with seven deaths. It has been proved that nearly all the patients obtained their disease from raw oysters that were infected.

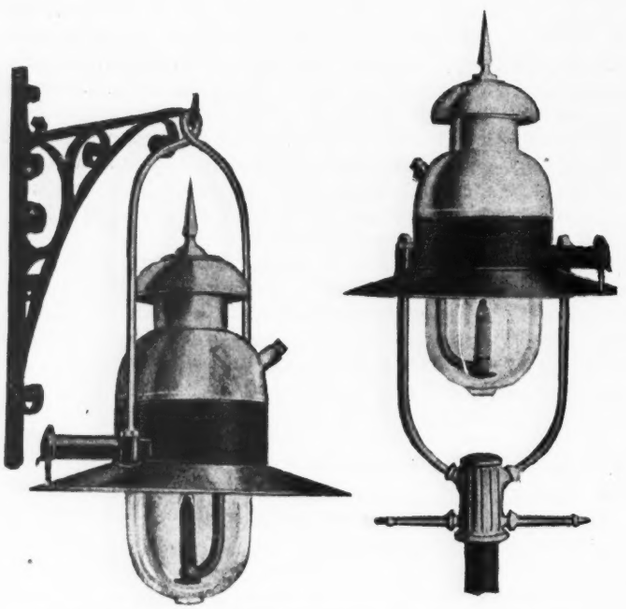
The supply of water from the artesian wells is free from organic matter, sediment, or color, and is abundant in quantity.

Respecting the trouble from electrolysis, Supt. Allen says that the only positive method of insuring the absence of currents on the water pipes is a complete insulated metallic circuit, such as is used in the double trolley system. Much, however, can be done by proper bonding and insulation of rails. The ordinance passed by the Council provides that the railroad companies must take means to furnish a complete metallic circuit both inside and outside the city limits, and will be held responsible for the result. The maximum difference in potential between any part of the metallic return circuits and any water pipe shall not exceed one-quarter volt; the current passing along any water or pipe shall not exceed one ampere. Tests are to be made in February and August of each year. Whenever any damage is done to pipes by electrolysis the company responsible shall repair the injury.

AN EFFICIENT STREET LIGHTING SYSTEM

Common Sense Applied to Street Lighting—Using This Method There Will Be No Ugly Poles to Mar Appearance of Street and No Wires to Put Underground

THE one thing that impresses the average American, when touring through the prosperous countries of Europe, is the attention that is given to making and keeping the country towns and villages pleasing to the eye. America is recognized as the most prosperous country in the world, yet its rural sections and the average country town bear the strongest evidence of past shiftlessness and almost an absolute lack of ability to appreciate and improve picturesque surroundings. The prevailing idea in many places, seemingly, has been to use cheap imitations of conveniences made necessary in congested cities.



TYPES OF LAMPS DESIGNED ESPECIALLY FOR THE AUTOMATIC

In nothing is this tendency more pronounced than in the methods adopted for street lighting. When the departure is made from the ugly and badly kept kerosene lamp in lanterns and the citizens are moved with the idea that they must be up to date, electricity is usually adopted.

Electric lighting has assumed, in the past few years, in some of our large cities, handsome and very artistic designs, but these forms of poles, lamps, etc., are very expensive and their cost in towns and even small cities prohibits their use. Electricity in any form is an expensive light, its convenience being its chief recommendation, except the modern arc electric, which is the recognized standard for street lighting. But these lights with their necessary wiring and poling have done more to disfigure cities and towns than any other modern convenience in use.

Their general ugliness is recognized by park commissioners, etc., and where beauty is sought they are rapidly being displaced. Something better has been found in the automatic lamp.

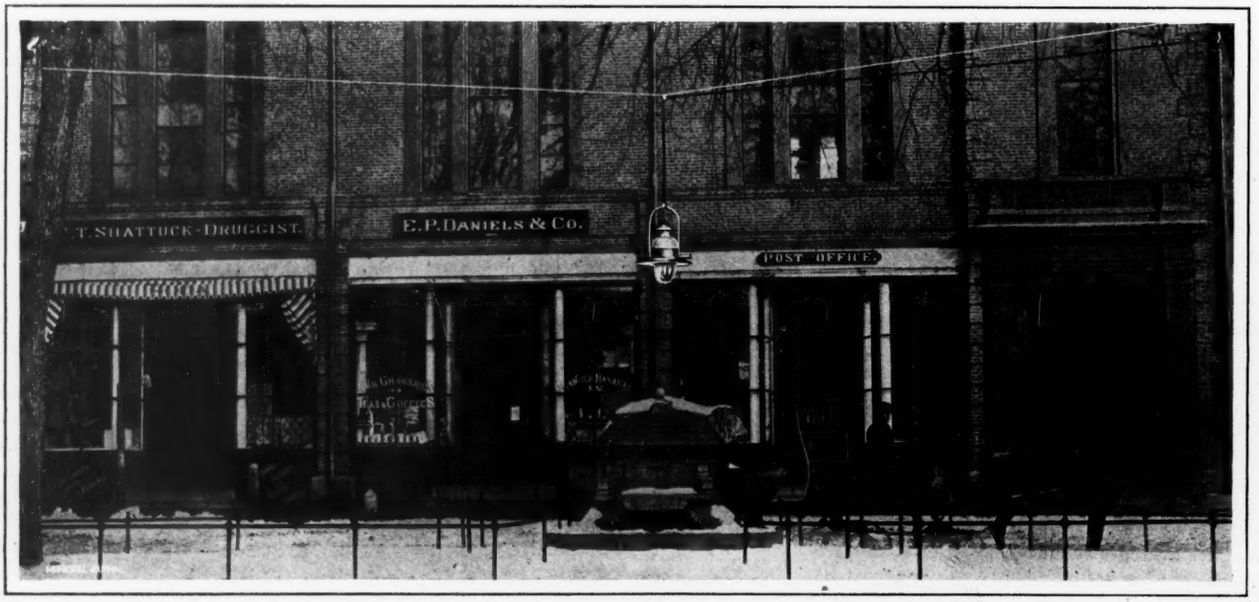
This lamp actually removes the necessity for electric lighting in any form or place, except in the most congested parts of cities, because it gives a light superior in quality and equal in quantity to the arc light. Its diffusive power is greater and it resembles more the appearance of daylight on foliage than any other and it cuts the price of electric lighting in half.

The town of Northborough, Mass., put in a trial installation of forty lamps in May, 1903, for six months, and the result was so satisfactory that it has recently adopted the automatic lamp street lighting system and added to the number put in on six months' trial and abandoned all other forms of street lighting,—and this, too, against a liberal offer to have electricity supplied to it from a nearby electric light plant.

Mr. Henry M. Knight, superintendent of street lighting of Worcester, whose opinion was sought by the lighting committee of the town of Northborough, recently said:

"In my judgment, the town of Northborough can get more effective lighting service on its streets, the character of the streets and the amount of shade on them being considered, with the present type (the automatic lamp) of lamp than with any system of electric lighting, the expenditure in both cases being the same, and the prices as noted."

The opinion of the members of this lighting committee, who investigated all systems, is summed up in the following letter:



INSTALLATION OF LAMP BETWEEN TWO FRIENDLY TREES, LAMP TO BE LOWERED OR RAISED FROM SIDE—LIGHTING TEAM SHOWN AT RIGHT EQUIPPED FOR WINTER USE

SHOWING HOW A FRIENDLY TREE IS PRESSED INTO SERVICE

THE SUMMER OUTFIT, FOR LAMP LIGHTING

"Northborough, Mass., October 19, 1903. Mr. T. H. Blair, Pres. Automatic Incandescent Light Co., Philadelphia.

"DEAR SIR: As you are well aware, we have favored lighting the streets of Northborough by the use of electricity, as it seemed the only means of economically supplying the town buildings and private individuals with electric light, but notwithstanding our recommendations the superiority of the 'Automatic Lamp' as a light producer and its behavior the past six months, particularly in the recent unusual gales, has led to its adoption by the town.

"In our researches, we investigated a large number of systems of lamps both by gravity and pressure, and although several makers of lamps were given an opportunity to place them in competition with the automatic lamp, none of them seemed inclined to try issues and none did. We have been unable to find anyone, including electric light men, who has not been free in his praise of the light shed by the automatic lamp, and we feel it is only just to your company to let you have this means of helping to make known the value of an invention that must be destined to have a great future. Yours sincerely, H. Leighton, G. F. Sargent, Ira C. Guptill, Lighting Committee."

The Automatic Incandescent Light Company has not only a street light, but a complete system and plan for doing everything necessary for the maintenance of installations, as shown by the illustrations. It supplies lighting wagons, utensils, posts, brackets, mast arms and special devices for suspending lamps in inconvenient places. All of these equipments are for sale or, if preferred, the company will undertake to light towns or sections by contract. Particulars furnished on application.

No system of lighting can be more effective and none can surpass it in attractiveness and as a means of adding to the value and appearance of the town or village adopting it. While people accustomed to living in the city, where there is an abundance of light, dislike the usual darkness of the country, they are usually the first objectors to the methods adopted for electric lighting in the average town. The automatic lamp removes all such objections, as it is the most up-to-date light in existence.

What Fast Train Operation Means

WHEN the "Twentieth Century Limited" train recently made a run on the Lake Shore Railroad of 133.4 miles from Toledo to Elkhart in 114 minutes, probably none of the passengers gave a thought to the real meaning of such a magnificent speed performance. In order to accomplish the feat a speed of fully 85 miles per hour had to be maintained for considerable portions of the distance. With a modern passenger train such speed can be attained with safety only when roadbed, track, equipment, discipline of employees and other operating conditions are about as perfect as human skill can make them.

The train consisted of six Pullmans, each weighing 55 tons, or a total of 330 tons; one combination baggage car weighing 30 tons and a locomotive 135 tons. To hurl a mass weighing a total of 495 tons, or 990,000 pounds, along steel rails weighing only 85 pounds to the yard means a sustained shock of tremendous force and a strain to track and roadbed which would search out the slightest weakness or defect.

One revolution of the engine drivers, which were 84 inches in diameter, carried the train forward about seven yards. In running one mile the piston rod must go backward and forward 247 times. A speed of 85 miles per hour means 1 5-12 miles per minute, so that the piston rod would have to go back and forth and the large drivers revolve six times each second, which is almost too rapid for the eye to follow. Experiments have shown that a train weighing as many tons as the "Twentieth Century Limited," when running at the rate of 85 miles per hour, cannot be brought to a stop within 3,000 feet, or 25-44 of one mile.

An "emergency" stop would be very likely, therefore, to mean disaster to such a train, and only perfectly operated signals and the highest art in train dispatching can insure the train against such stops. When it is realized also that a slight defect in any portion of the equipment or imperfect inspection of the same is almost certain to be followed by dire results, the wonder grows over the degree of perfection attained in the various arts and in discipline which have united in making modern train operation possible.—*Chicago Record-Herald.*

Fireproof Floor Construction

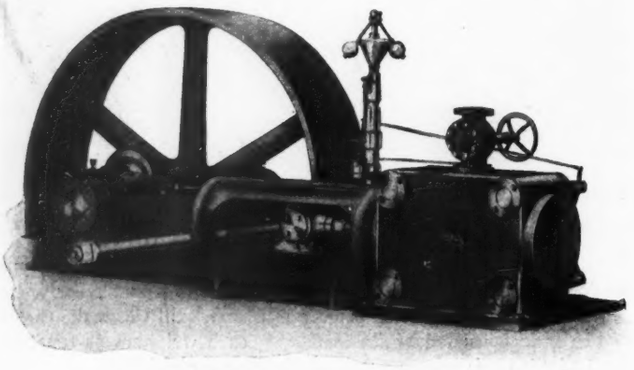
A SYSTEM of fireproof floor construction which is rapidly coming to the front is that of The International Fence and Fireproofing Company, Columbus, O. This Company has recently completed several buildings, which have shown remarkable tests; one is that of the Beloit Hotel at Beloit, Wis. This floor consists of a concrete slab fourteen feet by twenty feet and five inches in thickness, reenforced with the International cables and wire fabric. A space of five feet square was marked in the center of the span and loaded with 24,000 pounds. With this load the deflection was only one-sixteenth of an inch. Both the owners and architects were highly pleased with the result of the test.

It is probable that much of the success of this company's floors is due to the fact that the cables are firmly gripped by the concrete, which absolutely prevents slipping—a serious objection to plain bars. It is a fact worthy of note that there has never been a failure or collapse with the International system.

New Standard Reynolds Corliss Engine

We illustrate herewith a new Corliss engine which is being brought out by the Allis-Chalmers Company from the designs of Irving H. Reynolds. The field of Corliss engine design has been so fully worked over in the past, and the accepted designs have become so simple, that no strikingly novel designs are to be expected. The present machine, however, represents and combines all of the desirable elements of the best designs.

Engines of the type illustrated are being built in seven sizes, ranging from 50 to 500 horse-power, and are designed for steam pressures up to 150 pounds. They are built of somewhat shorter strokes than have heretofore been customary in Corliss engines, with the idea of economizing in space and making the construction more rigid.



The speeds are also somewhat higher than usual, ranging from 110 to 150 revolutions per minute, although these speeds are not higher than those at which the Reynolds-Corliss engines of older design are frequently operated.

The frame is cast in one piece with the slide, the construction being of the box type, resting on the foundation for its entire length. The main bearing shells are bored into the frame, thus insuring a solid bearing and also permitting the easy removal of the shells by rolling them out around the shaft.

The slide is of the barrel type with bored guides. The crosshead is fitted with babbitt faced shoes with wedge adjustment. The piston rod is screwed into the crosshead and held firmly with a steel lock nut. The cylinder is of the round cornered type, is fitted with double ported steam and exhaust valves, lagged with planished steel. The cylinder is set on a cast iron base plate, which extends under the valve gear, serving as a drip pan.

The valve gear is of the usual Reynolds Corliss type, the wrist plate being of skeleton pattern and fitted with a new type of disconnecting device which, while clamping the hook rod firmly, is very easily detached by hand.

The dash pots are of differential plunger type without leathers or backing of any kind.

The regulator is of the high speed weighted type, designed to control the engine within narrow limits of speed variation. The connecting rod is of steel with solid forged ends, fitted with bronze boxes, babbitt lined on the crank pin ends, the boxes being adjustable by means of screw actuated wedges.

The crank is of plain type, polished on the face, and is protected by a planished steel oil guard (not shown in cut).

The engines are fitted either with belt fly-wheels, as shown, or with square rim wheels where used with direct-connected electric generators. The crank and crosshead pins and main journals are of a size ordinarily used with heavy duty engines.

In brief, the engine is strong, simple and compact, and while nothing has been added for ornamentation, nothing contributing to economy or durability has been omitted, and the machine should find a large sale among power users who appreciate quality.

West Point's Origin

The operations of the troops engaged in the war of the Revolution directed attention to the romantic and commanding heights of West Point, and within a few years after the close of the contest, through the influence of surviving officers of the continental army it pleased President Washington to include in his message to Congress (1793) a recommendation for the establishment of a military academy here.

The act creating the academy did not pass until the year 1802, and then only as a means of giving countenance to the work of George Barren, who had, the year before, established a private school for cadets at the Point. It required the stimulus of a second war with the mother country to overcome the deep-rooted prejudice of the rural legislators against an institution which they believed would become a nursery of aristocrats, and it was, therefore, not until 1812 that the military academy became a part of the army establishment. *—From "Where Soldiers Are Made," by Frank H. Taylor, in Four-Track News for January.*

Diggs' Fire Extinguishers

The two hose wagons and hook and ladder truck shown in the accompanying illustration, are each equipped with two Diggs upright three-gallon fire extinguishers, and the tanks of the two double twenty-gallon chemical engines were also furnished by the Diggs Fire Extinguisher Company, of New York. This apparatus was built and the tanks mounted by J. G. Weir & Son, of Pittsburg, for the Munhall, Pa., fire department.

The Diggs Fire Extinguisher Company are making a specialty of turning out engine tanks for installation on apparatus already in commission, and are introducing their "Diggs device" for sealing the acid receptacle and releasing it instantaneously, throughout this country as well as abroad. They have recently shipped engines to Bombay, India, and Johannesburg, South Africa, and now have in their works orders from the Larkin Manufacturing Company, Dayton, O.; Italy, Texas; Enhaut, Pa.; Weir & Son, Pittsburg; St. Lawrence State Hospital, Ogdensburg, N. Y.; Fire Department, Charleston, S. C.; St. Albans, Vt.; Springfield, Mass., and a number of others.

The advantage of this device is that while the same object is obtained as by the break-bottle machines, viz.: releasing the acid quickly, the nuisance of broken glass is obviated, and the user of the device is independent of the manufacturer for bottles and supplies of chemicals.

EQUIPMENT OF MUNHALL, PA., DEPARTMENT

The "Little Giant" for Trench Work

A RECORD of over thirty years in the construction of steam shovels is one of which any company could well be proud. This is what the Vulcan Iron Works Company, of Toledo, O., has been doing for that length of time, and it has developed as a "past master" at the business. In the beginning it built steam shovels of two sizes, known as the "Giant" and "Little Giant," weighing forty and eighteen tons respectively. As the work of these machines has increased their strength has had a relative increase and the machines of the same name now weigh sixty and twenty-six tons respectively. Steam shovels are now constructed of varying sizes to suit the needs, the largest called for being ninety tons in weight.

The "Little Giant" is a wonder of efficiency for its class of work. It is designed for grading or digging contracts, where a heavy steam shovel cannot be used to advantage ,or the amount of work does not justify its purchase, together with the other part of such a heavy plant, including rails, cars, locomotives, etc. The "Little Giant" is made especially for contractors to be used in place of hand labor for all kinds of excavating, loading cars or wagons, cutting down embankments, digging canals or ditches for irrigating, railroad building, through cuts, gravel pit and ballast digging, etc. For sewer trench digging it is unequalled.

This machine has the distinction of being the only one of its kind in the United States. The company has spared no pains or expense in its construction, always selecting the best materials and paying for the most skilled workmen. It is so well built that there is little expense for repairs needed. It is self-propelling and will run on ordinary roads, or, if preferred, can easily be hauled by team.

Its efficiency can best be judged of by its capacity, which hanges from 300 to 1,600 cubic yards per day, according to the kind of material. It makes a saving of from 50 to 100 per cent. over hand labor.

The low price at which these machines are sold, and the work they will do compared with that of the larger machines now in use, place them within the reach of contractors or city authorities who would otherwise be obliged to resort to the old method of plows and scrapers.

Ordinarily the company builds the machines riveted solidly together, so as to withstand the vibration. It is practicable, however,

to bolt them together so they can be boxed, crated and easily handled, in case they are to be transported overland from rail destination, or for foreign shipment.

The company sends an experienced engineer for ten days at its own expense with every machine sold, to superintend setting up and operating the same so as to thoroughly demonstrate its capacity and durability to be as represented.

The Arthur Rail Block

THE Arthur patented rail-block, which was laid on West Main street this summer, has been in use now a sufficient length of time to have its merits fairly tested. It has been found to come fully up to the claims that were made for it, and has fulfilled the expectations of Supt. Arthur, who invented it. There is an excellent means of testing its relative qualities with the rail blocks used in Main street east of the Town Hall. At almost any time during the day, one can see wagons and carriages thrown around in all sorts of ways by the wheels entering the groove between the rail and the paving block. It is not an infrequent occurrence that the spokes in a wheel are wrenched off, and such accidents would be more common were it not for the care exercised by drivers. On the extension in Main street west of the Town Hall drivers experience no difficulty whatever. This is evident to any one who stands at the Town Hall corner to observe. Carriage wheels will become caught in the rail groove for only a few seconds, when they work out themselves owing to the arrangement of the patent rail block. A short time ago a driver who had heard a good deal about the Arthur block, and may have been a little skeptical regarding its merits, deliberately tried to keep the carriage wheels in the groove near the rails and utterly failed to do so for more than a distance of ten feet or so. The wheels would mount out of the groove and cross the rail without any friction at all to the carriage, and it was quite impossible to keep driving between the rails for any distance. Naturally this driver has become a pronounced advocate of the Arthur brick. If it were not for the patented blocks, there would be all kinds of complaints made by drivers turning into Main street west of Atlantic, and it is very possible that accidents would frequently occur. Although there is a network of tracks there, and very little free roadway on either side, yet drivers experience no difficulty at all in getting over the tracks.—*Exchange.*

Convention of Cement Manufacturers

FORTY-TWO companies manufacturing Portland cement were represented at the second annual meeting of the Association of Portland Cement Manufacturers, held recently at Sherry's, New York. The membership of the association represents a large percentage of the $350,000,000 invested in this business. Reports were received from committees appointed to confer with other associations in the matter of standard specifications for cement and steel concrete construction and uniform contracts between manufacturer and dealer, and manufacturer and consumer, the reports being discussed at some length.

The condition of the trade evoked much discussion. It was the sense of those present that with prices where they are now there would be a considerable decrease during the coming year of imports of foreign cement, which amounted to about 2,000,000 barrels on the Atlantic coast in 1903. The representatives of a number of mills stated that because of the great demand for cement during the past two years, which caused their mills to run night and day, it had been impossible to make the repairs which are absolutely necessary. In consideration of this fact it was agreed that the members of the association should close their mills for repairs far a period of not less than six weeks between Dec. 1, 1903, and April 1, 1904. The amount of cement on hand at the various mills on Dec. 1, 1903, was taken by districts and found to be light and considerably lower than was anticipated.

Consideration was given to the tentative agreement reached between the Secretary of the Interior and the cement manufacturers looking for the furnishing of cement for the Tonto basin dam in Arizona, estimated at 200,000 barrels. The dam will be constructed forty miles from the nearest railroad point, and owing to the high freight rate on material a cement mill will be erected by the Government at the site of the dam, with a view of having the cement manufactured there in case it can be done cheaper than if manufactured in an established mill and transported to the site of the dam.

The association voted to erect a building at a cost of some $35,000 to $50,000 at the Louisiana Purchase Exposition. A novel feature of this exhibit will be that the building will be constructed entirely of cement furnished by members of the association, and will be erected during the progress of the Exposition, thus illustrating the process of erecting buildings of cement.

The following officers were elected: President, John D. Lober, of the Vulcanite Co.; vice-president, A. F. Gerstell, of the Alpha Co.; secretary, E. M. Young, of the Lehigh Co., and treasurer, E. R. Ackerman, of the Lawrence Co. Executive Committee—H. W. Maxwell, of the Atlas Co.; W. H. Harding, of the Bonneville Co.; R. W. Lesley, of the American Co.; W. R. Warren, of the Virginia Co.; George E. Bartol, of the Dexter Co.; E. M. Hagger, of the Illinois Co., and S. B. Newberry, of the Sandusky Co.

At the banquet held recently Mr. R. W. Lesley, the retiring president, was presented with a silver loving cup in recognition of his services. Mr. Bard made the presentation speech, to which Mr. Lesley appropriately replied.

Sulphate of Iron for Water Purification

SULPHATE of iron has recently been adopted by a number of cities for water purification with satisfactory results, both in waters carrying high, as well as low turbidities, which is clearly illustrated by results obtained in purifying Missippi River water at Quincy, Ill., and Vicksburg, Miss., as well as Lake Erie water at Lorain, Ohio.

Sulphate of lime is used in combination with the iron, the amount required being determined by the amount of carbonate of lime found in the raw water and the amount of iron used.

The amount of iron required is based largely on the turbidity, which is readily judged by an experienced eye; probably no other coagulant has been discovered where as high efficiency can be obtained with as low cost.

By the action of iron and lime combined, floculent masses are formed which precipitate very quickly. In the precipitating process bacteria contained in the raw water becomes entangled in these floculent masses and are carried to the bottom. By this process alone without the aid of filtration, high efficiencies are obtained, especially with the more turibd waters, while with the aid of filtration a uniformly pure water is produced.

Sulphate of iron is a by-product with some of the largest manufacturing concerns in the country and the supply is unlimited; the price is very low and likely to remain uniform. It has been demonstrated the cost per million gallons of water purified is about 50 per cent. less with sulphate of iron to that of any other known coagulant.

With the rapid growth and development of our country, our sources of water supply are becoming greatly contaminated, resulting in a heavy increase in the typhoid rate, as well as other infectious diseases, even to the extent we are having epidemics such as have recently developed at Butler, Pa., where the cause has been traced to a contaminated water supply, and it behooves city governments to keep in touch with modern methods of water purification, thus preserving life and health in their respective communities.

When pure, wholesome, healthful water can be produced at a cost of from one to two dollars per million gallons as is now being done by several cities using sulphate of iron, it is nothing less than a crime that men holding offices of public trust, should place the lives of their constituency in jeopardy by ignoring the question of pure water.

Publications Received

—The Buffalo Pitts Company, of Buffalo, N. Y., has issued a new catalogue of forty-eight pages describing its threshers, traction engines, etc.

—Bulletin No. L 509 of the Laidlaw-Dunn-Gordon Co., of Cincinnati, O., is devoted to a description of Meyer-Gear Air Compressors with rolling-mill frames.

—All the necessary information about wire rope and other products of The American Steel & Wire Co., The Rookery, Chicago, Ill., is given in the latest catalogue of that company.

—The Peerless Rubber Manufacturing Co., 16 Warren street, New York City, has issued a 100-page catalogue, No. 60, telling about its fire and other hose, packing, tubing, gaskets, etc.

—Reliance steel stone crushers are described in a pamphlet gotten out by Julian Scholl & Co., the makers. Copies of the pamphlet may be obtained upon application to the company, 126 Liberty street, New York.

—Where Herringbone Expanded Steel Lath is used is told in a thirty-two page pamphlet issued by The General Fireproofing Co., of Youngstown, O. A large number of illustrations show the buildings in which this lath has been used.

—A most attractive booklet is that of the Medina Quarry Company, of 150 Nassau street, New York City, which discusses the use of Medina sandstone in buildings. Every other page is given over to an illustration of some building in which this stone has been used.

—The Office, Bank & Library Co. tells all about its steel vertical files for the perfect and systematic preservation of correspondence, papers, documents, etc., in a finely illustrated catalogue which shows the different styles made by this company, 157 Summer street, Boston, Mass.

—"Locomotor Engines" is the title of a forty-page catalogue of the Buffalo-Pitts Company, Buffalo, N. Y., and describes the traction engines, hauling engines, road locomotives, wagon cars and portable engines made by this concern. The pamphlet is attractively illustrated and bears the motto, "Cheaper Than Horses."

—"Ferroinclave" is the title given to a thirty-two page catalogue issued by the Brown Hoisting Machinery Co., of Cleveland, O., which tells of the many ways in which steel and cement fireproof construction is used for roofing, siding, flooring, etc., in modern buildings. It gives the results of a number of fire and strength tests of "Ferroinclave" and illustrations show how the material is applied.

Notes of Interest About the Trade

—The Borough Supply Company, 600 Degraw street, Brooklyn, N. Y., has furnished brooms to the Borough of Brooklyn for thirteen years, not to mention the supplies that have been furnished numerous other cities in the meantime. This record recommends the company to the street cleaning superintendents of other cities.

—The Loomis-Pettibone Gas Machinery Company has recently opened branch offices in the following cities: Boston, State Mutual Building; Pittsburg, Farmers' Bank Building; Chicago, First National Bank Building.

—The Morse Bolger Destructor Company, 39 Cortlandt street, New York City, was recently called upon, by the State Board of Health of Pennsylvania, to install one of its destructors on record-breaking time at Butler, Pa., to destroy the refuse and waste from the typhoid fever patients. The work was accomplished in just ten days from the receipt of the order.

—President David R. Francis, of the Louisiana Purchase Exposition, and the executive committee, after careful investigation, have selected the "Dixon" system for the destruction of all garbage and light refuse produced on the World's Fair Grounds, and have authorized the erection of a Dixon destructor plant, which will be the only working exhibit of this nature at the Exposition.

—The U. S. Wood Preserving Company, of New York City, recently laid several thousand square yards of creo-resinate wood block pavement on Warren street, New York City, much to the general satisfaction of all concerned. Although the contract was awarded late in the season and although contending with one snow storm and several rain storms, also suffering delays from the dilatoriness of the city authorities in removing the old paving blocks, the work was finished in good time and the result most satisfactory by the truckmen, who pronounce it a great improvement over the old stone block pavement.

—Water commissioners, superintendents and others interested in an economical administration of the water department will be much interested in the Cole-Flad Pitometer, which is especially designed to detect water waste, also for measuring the water flow in pipes from four to forty-eight inches in diameter. Full particulars can be had by addressing Edward S. Cole, Hydraulic Engineer, 635 Park Row Building, New York City.

—Mr. Frank T. Craven has resigned his position with the C. J. Field Conduit Company to represent the American Conduit Company, 170 Broadway, New York, Chicago and California.

—Late in November a Toledo daily paper announced that the Vulcan Iron Works has shut down indefinitely, owing to lack of orders. This newspaper yarn was made out of the "whole cloth," for the statement was untrue in every respect, and the publishers have been sued for $100,000 damages. This company has 150 men steadily employed and is getting more than the usual amount of business for this season of the year.

CONTRACT NEWS FOR THE MONTH

Including Paving, Sewerage, Water Supply, Lighting, Public Buildings, Sewage and Garbage Disposal, Fire Supplies, Contracts Awarded

N. B.—All news of proposed work sent us by city officials is incorporated in our Weekly Advance News Service and appears subsequently in this "Contract News for the Month" if the date of the reception of bids be sufficiently late to warrant placing the item here.

City officials and others are urged to send us all news of contemplated improvements for use in our Weekly Bulletins which are mailed to those interested.

PAVING, PAVING MATERIALS AND MACHINERY

Akron, O.—The estimated cost of extending Perkins street was placed at $14,750. City Engineer Payne.

Albany, N. Y.—The Board of Supervisors have provided for two roads.

Asheville, N. C.—It was stated that brick walks were to be constructed on Spruce street.

Atlanta, Ga.—Commissioner of Highways of Fulton County has contracted with Warren Brothers Company for two miles of bitulithic pavement on the county highway. The plant is to be rented, bitumen and patent rights purchased and expert advice secured from the Warren Brothers Co. The work is to be done chiefly with convict labor.

Atlantic City, N. J.—The paving of several small streets has been planned by Engineer Hackley.

Ballston, N. Y.—About thirteen miles of State road will be constructed in Saratoga County, at a cost of about $105,000.

Baltimore, Md.—An ordinance provided for the paving of Monroe street at $28,625.

Barberton, O.—High street will probably be paved.

Batavia, N. Y.—Nine miles of highway may be constructed. Com'r Harris.

Bay City, Mich.—Resolution called for the paving of Johnson street with brick and curbing.

Berkeley, Cal.—A resolution called for the macadamizing of Wheeler street. C. S. Markill, Clerk.

Belleville, Ill.—Mayor Fred J. Kern wrote that the city was ready to advertise for about $125,000 worth of street paving, three-fourths to be of brick, the rest asphalt. Bids are wanted January 20 for brick paving on W. Main and So. Illinois streets and asphalt on Race, 2nd and 3rd streets. Mayor F. J. Kern, President Board of Local Improvements.

Bridgeport, Conn.—The widening of Golden Hill street has been under consideration.

Bromley, Ky.—Bonds for street improvements have been issued. E. H. Wheeler, Town Clerk, Mullinsville.

Camden, N. J.—Asphalt paving was wanted by residents of Haddon avenue, Collinswood. An ordinance provided for the paving of Marion street with Belgian block.

Carlisle, Ind.—It was voted to build three miles of gravel road.

Champaign, Ill.—Bids are wanted about Jan. 1 for about 10,500 sq. yds. of brick pavement. City Engineer O. L. Gearhart.

Chester Pa.—Ordinances called for the laying of asphalt paving.

Columbus, Ind.—Bids are wanted Jan. 7 for about 9,325 sq. yds. of brick pavement on Washington street, and 7,000 sq. yds. on 5th street. City Clerk.

Columbus, Ga.—Broad street may be paved.

Crookston, Minn.—Bids are wanted Jan. 12 for macadam paving. City Clerk W. H. Graver.

Dallas, Tex.—Bids were asked for the paving of Akard street with brick. City Engineer.

Danville, Ill.—Ordinance provided for the paving of Robinson street at the cost of about $5,046.

Dayton, O.—Resolutions called for the paving of several streets. Talking over material for paving of Linden avenue. Dr. C. H. Leaman.

Delphi, Ind.—It was stated that Carroll County may spend $250,000 on road improvements.

Des Moines, Ia.—W. Grand avenue will be paved with brick.

Dunellen, N. J.—Talking of the construction of macadam roads in this place. (County of Middlesex.)

Edwardsville, Ill.—Brick paving has been considered.

Elliott, Pa.—Plans for grading and paving being made by McCully & Henderson, Pittsburg.

Elmira, N. Y.—Board of Supervisors appointed a committee to form plans for a system of highways.

Erie, Pa.—Considering the paving of Parade street to cost about $39,000.

Evanston, Ill.—Ordinance provided for granite top macadam on five streets and brick paving on one street.

Fonda, N. Y.—Plans were approved for about eighteen miles of roads, to cost about $176,400.

Frederick, Md.—Petitions called for the paving of E. Patrick and No. Market streets.

Freeport, Ill.—Will pave various streets with brick. Mayor Dittman.

Goshen, N. Y.—Resolutions called for appropriations for $23,150 for road improvements.

Grand Rapids, Mich.—The cost of asphalt block on concrete for Scribner street, and brick on concrete, was to have been ascertained. Board of Public Works.

Greece, N. Y.—$25,000 is to be spent on good roads. Town Board.

Greenwood, Miss.—A vote was to be taken on $50,000 bonds for paving. The Mayor.

Harristown, Ill.—There has been talk of laying sidewalks.

Hartford, Conn.—One street may be asphalted and one paved with Belgian block.

Hope, N. J.—There has been consideration of laying some macadam.

Houston, Tex.—Bids were to be asked for paving on various streets, to cost $300,000.

Hutchinson, Kan.—It was stated that several blocks of brick and asphalt paving were to be done. City Clerk S. F. Johnson.

Indianapolis, Ind.—A petition called for wood block paving on Northwestern avenue.

Iola, Kan.—A petition called for the paving of Jackson avenue with brick.

Jacksonville, Fla.—Bids were to have been asked for brick paving on Washington street.

Jefferson, Wis.—Ten blocks of brick paving will be laid in the spring. City Clerk.

Jersey City, N. J.—Plans have been made to improve several streets by paving, laying sewers, etc.

Johnstown, N. Y.—The county roads may be extended. Nellis Getman, Clk.

Kansas City, Mo.—Resolutions provided for brick paving on various streets.

Kingston, N. Y.—It was stated that $227,000 may be spent on State roads. Board of Supervisors, Ulster County.

Lake Charles, La.—Will vote on $65,000 bonds for street improvements. The Mayor.

Little Falls, N. Y.—Several streets may be paved with brick and Medina sandstone.

Louisville, Ky.—A petition called for the reconstruction of Kentucky street with asphalt. Hepburn avenue will probably be rebuilt. Board of Public Wks.

Lowell, Mass.—$26,300 will probably be spent on paving.

Lynn, Mass.—Bids were asked for the construction of a State highway to Point of Pines, Mass. Highway Commissioner, Boston.

McKeesport, Pa.—The widening of Walnut street has been planned.

Marion, Ind.—Petition called for the improvement of Highland avenue.

Marshalltown, Ia.—A number of streets may be paved in the spring.

Meadville, Pa.—A resolution called for the paving of State street. City Engineer W. A. Doane.

Milford, Conn.—Bids were asked for grading and building gravel roads. Board of Selectmen, E. L. Ford.

Milwaukee, Wis.—Mayor Rose is reported to have said that 12th street would be repaved with brick in the spring.

Moberly, Mo.—Winchester street will be paved with brick. City Clerk.

Montgomery, Ala.—Madison avenue will be extended, according to reports. City Clerk C. P. Hardaway.

Napa, Cal.—Fourth street will be macadamized. H. H. Thompson, Clerk.

New Orleans, La.—An ordinance provided for the paving of various streets.

New York, N. Y.—$1,750,000 appropriated to complete extension of Riverside Drive.

Oakland, Cal.—A boulevard may be built at a cost of $200,000.

Olive, N. Y.—A resolution provided for the improvement of Marbleton Road.

Oswego, N. Y.—The cost of laying brick on West 1st street has been estimated.

Pasadena, Cal.—Considering the widening of West Colorado street, to cost about $18,737.

Peoria, Ill.—Resolutions provided for the improvement and widening of Knoxville avenue.

Pittsburg, Pa.—The county has issued $550,000 bonds for road improvements.

Pleasant, Tex.—Will issue $50,000 bonds for good roads, according to reports.

Portland, Ore.—Plans have been prepared for improvements on various streets.

Portsmouth, Va.—Considering the asphalting of 4th street—16,000 sq. yds.—at a cost of $31,000. City Engineer Bascom Sykes.

Poughkeepsie, N. Y.—It was stated that about four miles of Albany Post Road was to be rebuilt. Board of Supervisors.

Rensselaer, N. Y.—$39,000 bonds for paving have been issued.

Riverside, Cal.—North street will be paved with asphalt.

Rochester, N. Y.—Linnet street will be asphalted, and probably one other street. City Engineer E. A. Fisher.

Rutherford, N. J.—The material for the paving of Park avenue has been under consideration. Hackensack avenue will probably be widened.

Rutland, Vt.—Curtis avenue will be extended.

Sacramento, Cal.—Petition calls for macadam paving on 12th street.

St. Paul, Minn.—Estimated cost of grading and paving Otto avenue with stone was placed at $5,347. Rosabel avenue was to have been paved with asphalt and sandstone. Board of Public Works.

San Francisco, Cal.—The estimated cost of paving Montgomery street with asphalt was placed at $13,000. City Engineer Grunsky.

Savannah, Ga.—Willy avenue, etc., was to be resurfaced at a cost of $15,000 by Chatham County. County Clerk.

Seattle, Wash.—Various streets are to be asphalted. W. H. Parry, Pres. City Council.

Schenectady, N. Y.—A petition called for the widening of Edison street.

Southampton, N. Y.—The town has granted $25,000 for highway improvement.

Springfield, O.—E. High street may be asphalted or macadamized.

Sterling, Ill.—Thirty-eight blocks are to be paved. Bd. Local Improvment.

Stockton, Cal.—A number of streets are to be improved. Bd. Pub. Wks.

Tacoma, Wash.—Pacific avenue is to be repaved. City Engineer.

Terre Haute, Ind.—About four and one-half miles of brick paving may be constructed in the spring.

Toms River, N. J.—Bids, Feb. 9, for about 17,153 feet of gravel road in Union township. J. E. Otis, Dir., Bd. of Freeholders.

Topeka, Kan.—County Commissioners have prepared plans for extensive road building.

Washington, D. C.—A paved highway may be laid to Mt. Vernon.

White Plains, N. Y.—It was reported that $43,000 was voted for about twenty miles of State road.

Winnipeg, Man.—Asphalt will be laid on Spence street, to cost $10,835; and on Balmoral place at a cost of $19,542. C. J. Brown, City Clerk.

CONTRACTS AWARDED

Atlanta, Ga.—Contract for asphalting No. Pryor street awarded Venable Bros.

Bayonne, N. J.—It was said that J. J. Cogan was awarded contract for improving 43d street, at $4,228.

Buffalo, N. Y.—Contract awarded German Rock Asphalt Co. for asphalting Cleveland avenue.

Cadiz, O.—E. Brentlinger, Dayton, has contract for Honeymoon pike, at $11,550.

Camden, N. J.—Vulcanite Paving Co. has contract for paving two streets with asphalt, at $1,89 per sq. yd.

Cape May, N. J.—Robert E. Hand, Erma, was low bidder for 11,759 feet of gravel road, at $26,220.

Cincinnati, O.—Kirchner Const. Co. was low bidder for resurfacing 4th street with asphalt, at $63,006.

Davenport, Ia.—Tri-City Constr. Co. has contract for paving 29th street, at $6,500.

Dayton, O.—M. G. Cain has contract for Athens block paving on Keowee street, at $7,007.

Galveston, Tex.—Contract awarded Goodhart & Bates, 74 Broadway, N. Y., for raising grade of city seventeen feet.

Hamburg, N. Y.—Contract for paving three streets with brick let Louis H. Clapp, Buffalo, at $29,900.

Lenox, Mass.—Reported that Barnes & Farnham has contract for two and one half miles of macadam road, at $22,425.

Louisville, Ky.—Reported that G. W. Gosnell has the contract for paving Zoss avenue with brick, at $1.57 per sq. yd. Contracts awarded W. H. Cornell for sidewalks on six streets; L. R. Figg, for walks on eleven streets. Barker Asphalt Pav. Co. received contract for paving part of Virginia avenue, at $1.62 per sq. yd.

Marion. O.—Contract awarded Lake Erie Asphalt Block Co. for about 12,500 sq. yds. of paving.

New York, N. Y.—F. V. Smith Contracting Co. was low bidder for Sects. 3 and 4 of Riverside Drive extension. F. G. Hart & Co. were low bidders for grading, curbing, flagging, etc., of 171st street, at $24,967. Uvalde Asphalt Co. was low bidder for asphalting Broadhurst avenue, at $12,485. Cunningham & Kearns Contracting Co. were low bidders for the paving with granite block of old and new Elm street, at $33,150.

Norfolk, Va.—Denby Grading Co. has contract for stone curbs on Park avenue, and will construct about 80,500 feet of paving, at cost of $45,000.

Oakland, Cal.—Hillhouse & Riordan will repave Telegraph avenue, at 22½ cents per sq. ft.

Portsmouth, N. H.—T. H. Gill & Co., Boston, Mass., has contract for section of ocean boulevard, at $12,729.

Quincy, Ill.—H. S. Brown has contract for wagon road.

St. Augustine, Fla.—Geissman & Leonardi has contract for brick paving and granite curb on No. Charlotte street.

Schenectady, N. Y.—Contract awarded Schenectady Contr. Co. for grading and paving six streets.

Seattle, Wash.—T. Ryan & Co. has contract for concrete walks at $4.965.

Somerville, N. J.—It was reported that Aug. Munson & Co. received contract for seven and one-fourth miles of macadam road; and J. McNabb, one and one-half miles.

Spencer, Ind.—Gross & Martin, Freeman, has contract for improving two highways, at $15,514.

Springfield, Ill.—Welsh & Patterson has contract for brick paving on Grand avenue, at $1.37 per sq. yd.

Tacoma, Wash.—Stoll & Games has contract for improvement of So. C street, at $10,765.

Toledo, O.—H. G. Jennison was low bidder for improving Dawson street with brick and sand foundation and Berea curb.

Wilmington, N. C.—Contract awarded Roger Moore for brick on Market street, at $1.73 per yd.

LIGHTING AND TELEPHONE

Abbeville, Ala.—An electric lighting system may be installed.

Auburn, N. Y.—It was stated that the county might do its own lighting by putting in a dynamo in heating plant.

Avoca, N. Y.—This village was to be lighted by electricity, according to a press report.

Belleville, Ill.—A municipal electric light plant has been under consideration. Mayor Fred J. Kern.

Beloza, Miss.—Plans for a $20,000 electric light and water plant have been made by W. H. Harvey, Memphis, Tenn.

Biggs, Cal.—It voted to issue $12,000 bonds for electric light and water plant.

Black River, Wis.—The city may run its own electric light plant. Mayor Bright.

Camden, N. J.—A municipal electric light plant may be put in.

Charlestown, Ind.—An electric light plant may be put in. David Pitman.

Cleveland, O.—The only bidder for 2,696 vapor lights for city was the Western Street Lighting Co., Kansas City, Mo.

Cliffdale, N. C.—The Cliffdale Telephone Co. was incorporated at $5,000. J. A. Calton, G. W. Long.

Clinton, Miss.—A vote was to be taken on bonds for an electric light plant and water works. The Mayor.

Crewe, Va.—An electric light plant has been under consideration.

Danville, Va.—It was reported that $8,000 would be spent in increasing the city electric light plant. Supt. F. Talbot.

Durant, Ind. Ter.—It was voted to issue $89,000 bonds for water works and electric light plant. The Mayor.

Eaton Rapids, Mich.—It was reported that a bond issue of $12,000 would be made for an electric light plant.

Elmer, N. J.—The question of having electric lights on the streets has been under consideration.

Essex, Ia.—An electric light plant has been proposed. Farris & Eastman, Clarinda, Ia.

Girard, Kan.—The city may erect a $20,000 electric light plant. Mayor W. H. Ryan.

Glendora, Cal.—This town may have an electric light plant.

Hamburg, Ia.—An electric light plant has been proposed.

Irvington, N. J.—A municipal light plant has been under consideration.

Joplin, Mo.—A vote may be taken on $30,000 bonds to enlarge the city electric light plant.

Labelle, Mo.—Bonds have been voted for an electric light plant. The Mayor.

Lexington, Neb.—It was reported recently that the city clerk was asking propositions for an electric light plant.

Livingston, Mont.—It is stated that the electric light plant that was burned will be rebuilt.

Louisburg, N. C.—It was stated that $65,000 bonds were issued for light and water purposes.

Louisville, Miss.—The Central Mississippi Telephone Co. has been incorporated at $10,000. M. H. Woodward.

Lumpkin, Ga.—An electric light plant has been under consideration, to be erected in 1904. Mayor J. B. Richardson.

Medford, N. J.—Considering system of street lights. A gas company may be formed.

Naponee, Ont.—The question of electric lighting has been under consideration.

Nevada, Mo.—Will vote on $90,000 bonds for city electric light plant and water works, according to reports. The Mayor.

New Orleans, La.—It was stated that bids were to be asked for lighting by electricity.

Newport News, Va.—A $100,000 electric light plant may be erected. Mayor A. A. Moss.

Norway, Ia.—An electric lighting plant has been under consideration.

Oakfield, N. Y.—It was stated that the village wanted electric lights instead of kerosene.

Ontario, Cal.—A franchise has been asked by the Home Telephone Co.

Point Pleasant, Va.—C. F. Lowther will receive franchise for a gas plant.

Port Clinton, O.—E. H. McDowell has a franchicse to lay pipes and furnish gas to the city.

Quincy, Ill.—Independent Gas Co. incorporated to make gas. Capital, $300,000.

Sandersville, Ga.—Bids were to be asked in January for a $40,000 electric light and water plant. W. A. McCarty, Chn. Comm.

San Diego, Cal.—The Home Telephone Co. has a franchise for a telephone system.

Stowe, Vt.—An electric light plant may be installed at Moscow Mill for lighting village. W. A. Drucker.

Tallula, Ill.—An electric light plant may be installed.

Troy, Idaho.—An electric light plant has been talked of. P. Johnson, Spokane, Wash.

Tucson, Ariz.—An electric light plant has been under consideration.

Union, Ore.—Sparta Electric Light & Power Co. has 25-year franchise.

Valley City, N. D.—It is stated that A. H. Grey bought the municipal electric light and pumping plant at $20,500.

Wartrace, Tenn.—May install an electric light plant. The Mayor.

Weedon, Ill.—The electric light plant of V. C. Sivigart has been purchased by this place.

West Chester, Pa.—Talking of an electric light plant. C. H. Pennypacker, Ch. Burgess.

West Mansfield, O.—It was voted to put in an electric light plant.

White Cloud, Kan.—An electric light plant has been talked of.

Winfield, Kan.—May vote, according to reports, on $134,000 bond issue for an electric light plant, water works, etc.

Wingham, Ont.—It was voted to buy the local electric light plant for $28,000.

Wittenburg, Wis.—It was voted to spend $8,000 for municipal lighting plant.

Yankton, S. D.—May buy the electric light plant of W. H. Edmunds.

CONTRACTS AWARDED

Alameda, Cal.—Contract for new street lamps awarded the Westinghouse Electric Co., at $4,629.

Capac, Mich.—Fisher Electric Co., Topedo, O., has contract for electric light plant, at $5,913.

Corona, Cal.—Corona Gas & Electric Co. has five-year contract for arc lamps.

Corvallis, Ore.—Corvallis Electric Light & Power Co. has contract for street lighting.

Dixon, Ill.—Dixon Power & Light Co. has contract for installing 100 incandescent electric lamps of 25 c. p. in place of 85 gas lights.

Ellington, Conn.—Rockville Gas & Electric Co. will probably supply electric lights for village.

Geneva, N. Y.—Contract for street lighting for five years let Geneva Power & Light Co., at $75 for arcs and $20 for incandescents.

Jersey City, N. J.—American Lighting Co., of Baltimore, was low bidder for lighting city with gas and oil lamps, at $27 per light.

Moline, Ill.—Contract awarded People's Power Co. for lighting streets for five years, at $65 per lamp—about 210 lights.

New Haven, Conn.—Three-year contract let American Lighting Co., of Baltimore, for lighting.

Ocean Grove, N. J.—The Coast Gas Co. has contract for lighting this place with gas.

Sacramento, Cal.—Sacramento Electric, Gas & Railway Co. has contract for lighting city, at $7.25 per lamp per month.

St. Paul, Minn.—Cleveland Vapor Light Co. received contract for gasolene lamp-posts—2,370 posts at $4 each, and 130 at $7 each.

Scotland Neck, N. C.—Contract for electric lighting plant for city let Standard Electric Co., Norfolk, Va.

Yreka, Cal.—Contract for city lighting awarded Yreka Electric Light Co., at $50 a month for five years.

PUBLIC BUILDINGS

Athens, Ga.—The estimated cost of the new post office is placed at $75,000.

Athens, Ga.—The estimated cost of the new post office is placed at $75,000. J. K. Taylor, Treas. Dep't, Washington, D. C.

Baltimore, Md.—It is stated that $2,000,000 may be spent on the school system. Mayor McLane.

Belleville, Ill.—Mayor Fred J. Kern wrote that a public bath has been under consideration.

Bessemer, Ala.—A $100,000 government building may be erected here.

Bristol, Tenn.—A new court house is desired.

Buena Vista, Ga.—The estimated cost of a new jail for Marion County is placed at $5,000.

Buffalo, N. Y.—Plans have been prepared for a marine hospital to cost $100,000. J. K. Taylor, Treas. Dep't, Washington, D. C.

Camden, N. J.—Bids are to be asked, probably in January, for $600,000 county court house. Irving Buckle, Chn. Com. $90,000 school bonds will probably be issued. Pres. Board of Education.

Canandaigua, N. Y.—The Supervisors voted $55,000 for a new jail.

Cedar Rapids, Ia.—Library trustees are considering plans for a Carnegie Library.

Cleveland, O.—The estimated cost of a city hall placed at $1,500,000, plans for which have been under way.

Columbia, Tenn.—A $100,000 court house may be erected.

Dallas, Tex.—$15,000 bonds have been issued for a court house.

Fresno, Cal.—Plans for a city hall to cost $75,000 have been made.

Geneva, N. Y.—Estimated cost of a post office placed at $75,000. J. K. Taylor, Treas. Dep't, Washington, D. C.

Grafton, W. Va.—$55,000 bonds for schools have been issued.

Harrisburg, Pa.—Estimated cost of Lincoln School is about $60,000.

Harrison, Ark.—Bids are wanted January 7 for U. S. post office and court house. J. K. Taylor, Treas. Dep't, Washington, D. C.

Henderson, Ky.—A new public library, to cost $60,000, will be erected.

Hoboken, N. J.—There has been some talk of a new court house for Hudson County.

Hornellsville, N. Y.—C. E. Yost, Chn. Bldg. Com., advised us that a $25,000 Carnegie Library was to be erected.

Indianapolis, Ind.—Huntington County may have a new $250,000 court house. J. W. Gaddis, Vincennes.

Kansas City, Mo.—Bids, January 8, for extension to the post office and court house. J. K. Taylor, Treas. Dep't, Washington, D. C.

(Continued on page 30.)

Manila, P. I.

"Enclosed find money order covering subscription account of the City of Manila for copies of the MUNICIPAL JOURNAL AND ENGINEER."

O. F. RICARD, Chief Clerk of Municipal Board.

Pittsfield, Mass.

"Send the MUNICIPAL JOURNAL to the following city offices, and send bill against the City of Pittsfield to"

J. W. LEWIS, City Clerk.

Belleville, Ill.

"Enclosed you will find city draft in payment of twenty subscriptions to your valuable publication, the MUNICIPAL JOURNAL AND ENGINEER, all copies to be addressed to Belleville, Ill., as per attached list of city officials."

FRED J. KERN, Mayor.

Cortlandt, N. Y.

"I brought the MUNICIPAL JOURNAL before the Common Council of our city last Tuesday evening, and they ordered fourteen subscriptions for the city officials. I consider your journal an excellent one, and believe the city will be benefited by these subscriptions."

E. S. DALTON, City Clerk.

Schenectady, N. Y.

"Be it resolved by the Common Council of the City of Schenectady, N. Y., that the Municipal Journal Publishing Co. of New York be authorized to supply the City of Schenectady regularly with the MUNICIPAL JOURNAL AND ENGINEER to the number of thirty-two copies, according to names of the city officials to be furnished by the City Clerk; and the Treasurer of the city is hereby authorized and directed to draw a warrant for the payment of the annual fee, from funds not otherwise appropriated." Adopted by a unanimous vote of the Common Council.

CITY OF SCHENECTADY, N. Y.

Duluth, Minn.

"You may continue sending the MUNICIPAL JOURNAL AND ENGINEER to all the councilmen and city officials for another year, as per city voucher enclosed. I would state that the city officers are very much pleased with the high character of the articles appearing in the Journal, and the Council ordered the continuance of same for the ensuing year without dissent."

H. W. CHEADLE, City Clerk.

Omaha, Neb.

"By resolution No. 1852, adopted by the City Council of the City of Omaha, I was directed to order five copies of the MUNICIPAL JOURNAL AND ENGINEER to be sent monthly to the attached addresses of city officials, all said copies to be delivered at the City Hall, Omaha, Neb."

W. H. ELBOURN, City Clerk.

Shreveport, La.

"I hand you our City Comptroller's warrant, for which please send 20 copies of the MUNICIPAL JOURNAL regularly to the list of city officials enclosed."

ANDREW CURRIE, Councilman.

Detroit, Mich.

"Send the MUNICIPAL JOURNAL AND ENGINEER to the attached list of councilmen and city officials. We enclose affidavit blank, which you will please execute and return with your bill to this office."

F. A. BLADES, Controller.

Sheboygan, Wis.

"Enclosed find city order in payment for one year of the twenty-four copies of the MUNICIPAL JOURNAL of New York, sent regularly to the City of Sheboygan."

JOHN F. ARMSTRONG, City Clerk.

Phœnixville, Pa.

"Please send the MUNICIPAL JOURNAL AND ENGINEER regularly to the following councilmen and borough officials, numbering fourteen names, and bill to the undersigned."

J. P. EACKES, Clerk of Town Council.

Seattle, Wash.

"Enclosed find Controller's Warrant in payment for eighteen copies of the MUNICIPAL JOURNAL sent regularly to this city."

CITY OF SEATTLE.

The few sample orders for subscriptions to the MUNICIPAL JOURNAL AND ENGINEER, as shown above, illustrate how progressive municipalities, from the smallest to the largest, subscribe for the MUNICIPAL JOURNAL. Our complete list embraces a large proportion of towns and cities from 3,000 upwards.

MUNICIPAL JOURNAL PUBLISHING CO., New York.

Lafayette, Tenn.—A new court house, to cost $80,000, and a $20,000 jail, are to be erected. County Clerk, Campbell County.

Lancaster, Pa.—May enlarge the public buildings to the extent of $125,000.

Lawrence, Mass.—It was reported that $140,000 school bonds were sold.

Logansport, Ind.—A $60,000 city building may be erected. Mayor Vaughn.

Lorain, O.—Reported to have issued $75,000 school bonds.

Lott, Tex.—Will erect a $20,000 school. The Mayor.

Marquette, Mich.—Will sell, January 18, $110,000 bonds for a court house. W. A. Ross, County Clerk.

Montgomery, Ala.—Will spend $25,000 to rebuild Herron street school. The Mayor.

Moultrie, Ga.—$20,000 school bonds have been issued.

Newark, N. J.—The estimated cost of a county hospital is placed at $200,000.

Newton, N. J.—Considering the erection of a new town hall.

Oklahoma City, O. T.—It was voted to issue $100,000 for a court house. The Mayor.

Ottawa, Ill.—It is stated that a $45,000 school will be erected.

Perryville, Mo.—Bids are wanted January 30 for $35,000 court house for Perry County. Archt. J. W. Gaddis, Vincennes, Ind.

Piqua, O.—$15,000 bonds for an engine house were to have been sold on December 28. B. A. Reed, Auditor.

Pittsburg, Pa.—The Prinos Board is contemplating improvements to the jail to cost $300,000.

Portland, Me.—May have a new public library to cost $250,000.

Rutledge, Tenn.—Grainger County will build a $25,000 court house. County Clerk.

Ste. Cunegonde, Que.—Plans are being prepared for a $30,000 city hall.

Salina, Cal.—Plans are ready for a county jail to cost $27,000.

San Jose, Cal.—Plans are being prepared for a new county building.

San Mateo, Cal.—A new high school will probably be erected.

Santa Monica, Cal.—The estimated cost of new bath house for Ocean Park is placed at $140,000.

Saratoga Springs, N. Y.—Estimated cost of new post office placed at $90,000.

Savannah, Ga.—Bids are wanted January 14 for a city hall. Mayor Herman Meyers.

Vincennes Ind.—Bids were asked for about January 1 for new $75,800 post office.

Washburn, Wis.—Bids are wanted January 16 for a library. C. O. Sowder, Sec'y Library Board.

Washington, D. C.—The Commissioners have asked $1,025,000 for schools and a municipal building.

Woodlawn, Ala.—It was voted to issue $15,000 for a school. The Mayor.

York, Pa.—Plans have been prepared for a new school in 10th Ward, to cost $45,000.

Youngstown, O.—Plans for the proposed city hall have been drawn by Archt. E. R. Thompson.

Contracts Awarded

Berkeley, Cal.—Robert Greig has contract for Carnegie Library, at $33,985.

Brooklyn, N. Y.—John Kennedy & Son received contract for armory for Troop C., at $419,500 E. H. Thatcher was low bidded for court house on Gates avenue, at $45,299.

Chattanooga, Tenn.—Contract awarded Joseph Trimby for Carnegie Library, at $132,000.

El Dorado, Ark.—Pauly Jail Co. has contract for Union County's jail, at $21,500.

Goldsboro, N. C.—Contract awarded King Lumber Co. for post office, at $40,000.

Greeneville, Tenn.—Contract for post office awarded Miles & Bradt, Atlanta, Ga., at $86,897.

Huntsville, Ala.—Contract awarded J. P. Hamilton for Madison County court house, at $13,000.

Kansas City, Mo.—Thos. Lowell, Denton, Tex., was low bidder for addition to post office, at $299,577.

Knoxville, Tenn.—Galyon & Borches has contract for fire station, at $23,057.

Lafayette, Ga.—Contract for jail awarded Pauly Jail Co., St. Louis, Mo., at $20,000.

Lakeport, Ia.—H. E. Potter Contr. Co. has contract for school, at $17,900.

Louisville, Ga.—Contract awarded for court house for Jefferson County. County Clerk.

Minneapolis, Minn.—Pike & Cook has contract for pavilion at Lake Harriet, at $29,888.

Omaha, Neb.—T. O. McDonald has contract for high school, at $74,475.

Pekin, Ill.—It is stated that Conklin, Hippen & Reuling Co. has contract for pavilion and palm house, at $12,525.

St. Louis, Mo.—Eckhard Wind was low bidder for new city hall, at $147,500.

Santa Monica, Cal.—Continental Constr. Co. has contract for Carnegie Library, at $12,499.

Scranton, Pa.—M. J. Ruddy has contract for high school, at $100,000.

Seattle, Wash.—Megrath & Duhamel has contract for new Federal building, at $605,000.

Shelbyville, Ill.—Bulley & Andrews, Chicago, has contract for Carnegie Library, at $14,000.

(Continued on page 31.)

From the Daily Press

"The Municipal Journal and Engineer, of New York, is a periodical that should be placed by the city in the hands of every councilman and city official."

Scranton Tribune, Scranton, Pa.

"The Municipal Journal and Engineer discusses all topics of general interest to municipal officials, and there is much valuable information in it for engineers."

Milwaukee Sentinel, Milwaukee, Wis.

"The Municipal Journal, of New York, is the leading periodical in its field. It is finely illustrated and contains a great variety of special articles, news and miscellany upon the subject of municipal government. Each number contains a vast variety of information not otherwise obtainable that is invaluable to city officials and all others interested in municipal government, and this includes everybody."

The Enquirer, Oakland, Cal.

"The Municipal Journal and Engineer of New York is the foremost journal of its character in the country, and is an authority on the subject of road and street building."

The Times, Leavenworth, Kansas.

"The Municipal Journal of New York is a periodical which is recognized everywhere as authority in all matters which bear upon the growth and improvement of cities."

The Sun, Springfield, Ohio.

"The Municipal Journal and Engineer of New York is the leading periodical in its field."

The Oakland Enquirer, Oakland, Cal.

"The Municipal Journal of New York contains a large amount of interesting and instructive information on municipal topics, including much that is pertinent to the life and conduct of every considerable municipality. It is full of interest and value, and should be studied faithfully by the "Fathers" of all progressive cities. This publication costs $3.00 per year, and it is richly worth it, as it covers matters of moment to every progressive town, full of value in suggestions and facts. The editorial articles are timely and interesting, in fact, the magazine is a compendium of helpfulness for every man who has upon him the responsibility of the administration of municipal affairs."

The Standard, Bridgeport, Conn.

"The Municipal Journal and Engineer of New York is one of the ablest magazines published in this republic, and is replete with matters of interest to the officials and residents of every municipality in the country."

Herald, Bayonne, N. J.

"The Municipal Journal and Engineer of New York contains many practical articles relating to civic topics generally, and the subjects portrayed are most interesting to those engaged in municipal affairs."

Manitoba Free Press, Winnipeg.

"The Municipal Journal and Engineer of New York is well fitted for its arduous and responsible work."

Press Knickerbocker Express, Albany, N. Y.

"No person interested in municipal work and public improvements can afford to do without this magazine."

Terre Haute Gazette, Terre Haute, Ind.

"The Municipal Journal and Engineer of New York is full of interesting suggestions and information."

Minneapolis Journal, Minneapolis, Minn.

"Indispensable to those who desire to become thoroughly informed regarding municipal matters."

The Tribune, New York.

"The Municipal Journal of New York is fairly crowded with timely articles on municipal affairs. No public official can afford to do without this magazine."

The Times, Trenton, N. J.

Warrensburg, Mo.—Moore Bros., Kansas City, has contract for State Normal school, at $47,400.

Windom, Minn.—Omeyer & Thori, St. Paul, has contract for court house, at $50,000.

WATER SUPPLY

Algona, Ia.—Talking of a filter for the water works.

Avon-by-the-Sea, N. J.—An ordinance provides for $35,000 bond issue for water works.

Brazil, Ind.—There has been talk of improving the water supply.

Camden, N. J.—May lay about 20,000 ft. of 30-inch pipe. Authority was asked to issue $200,000 bonds for improvements. City Engineer Farnham.

Canton, O.—A new pumping station and plant has been under consideration by the Board of Public Service.

Carlisle, Pa.—It is reported that bonds for water works were voted.

Charlotte, N. C.—It is stated that $200,000 bonds for enlarging the works are to be issued. C. H. Campbell, Supt.

Chickasha, Ind. Ter.—$75,000 bonds for water works have been issued.

Dallas, Tex.—Board of Commissioners were authorized to issue $35,000 bonds for water mains.

Danville, Ky.—Improvements to water works to cost $20,000 will include filtration plant and new mains.

De Soto, Mo.—Plans have been prepared for water works to cost $75,000. The Mayor.

Detroit, Mich.—12-inch mains will be substituted for 6-inch in five streets. Board Water Commissioners.

E. Greenwich, R. I.—O. P. Sarle, C. E., will advise Water Works Comm. on cost of works.

Edwards, Miss.—C. H. Jenks, C. E., has been estimating cost of works.

Ellicott City, Md.—Considering water supply, etc. Mayor Mercier.

Grossdale, Ill.—May install $60,000 water works.

Jasper, Ala.—It was reported that 750,000 gal. pump, three miles of mains and 34 hydrants will be installed.

Kansas City, Mo.—Ordinance passed to issue $500,000 bonds for water supply.

Knoxville, Tenn.—Estimates have been under way for new water works. Water Supply Commission.

Lancaster, Pa.—Filtration system being considered.

Ligonier, Ind.—Planning for rebuilding of water works.

Mankato, Minn.—Plans under way for addition to water works.

Maynard, Mass.—Cost of water works improvements placed at $35,000.

Memphis, Tenn.—It was reported that the Water Commission had been considering adoption of the meter system.

Milwaukee, Wis.—West Allis will lay mains to obtain water from this city.

Missoula, Mont.—Water works question under consideration. Mayor M. R. C. Smith.

Mt. Ayr, Ia.—Considering the construction of water works.

Nevada, Mo.—Cy. Eng'r James M. Clack wrote that it was voted on December 1 to build a $90,000 city water works plant.

Newark Valley, N. J.—Talking about installing water works.

New Orleans, La.—Bids are wanted, February 2, for 2.7 miles of 6 to 16-inch mains; 2,600 tons of c. i. pipe; 113 tons of special castings; 36 water gates and 24 hydrants. Plans for pumping machinery are to be ready in January, and, later, plans for filters.

Northfield, Vt.—Agitating water supply.

Oil City, Pa.—May build new pumps for the water works.

Ottumwa, Ia.—Voted against municipal water works and for a 25-year franchise to Underwood & Slingluff.

Poplar Bluff, Mo.—All except private residences must install meters.

Pratt City, Ala.—It is stated that the city will lay 1,000 ft. of additional mains in the West End.

Pueblo, Colo.—It is stated that $150,000 was appropriated for North Side water works.

Quincy, Mass.—$10,000 will be spent on water pipe.

Reading, Pa.—$60,000 appropriated for filtration plans for Antietam water supply.

Rome, N. Y.—May have pumping plant at Ridge Mills. Comr. Wiggins.

Sacramento, Cal.—$12,500 worth of pipe and water plugs may be bought.

Sandusky, O.—Committee will probably recommend filter plant.

Springfield, Neb.—Village board will ask new bids for water works.

Summit, N. J.—Voted not to buy plant of Essex-Union Water Co.

Sycamore, Ill.—Considering $20,000 bonds for improving water works, and paving.

Wausa, Neb.—Probable cost of new works, $6,000. Vil. Clk. Keller.

Whatcom, Wash.—May put in 3,000 feet of steel pipe. Supt. Clark, Water Works.

Wheeling, W. Va.—May improve works and lay 9,000 ft. of mains. City Engineer C. B. Cook.

Wrentham, Mass.—Surveys being made for water works.

Wiscasset, Me.—Agitating for a water supply.

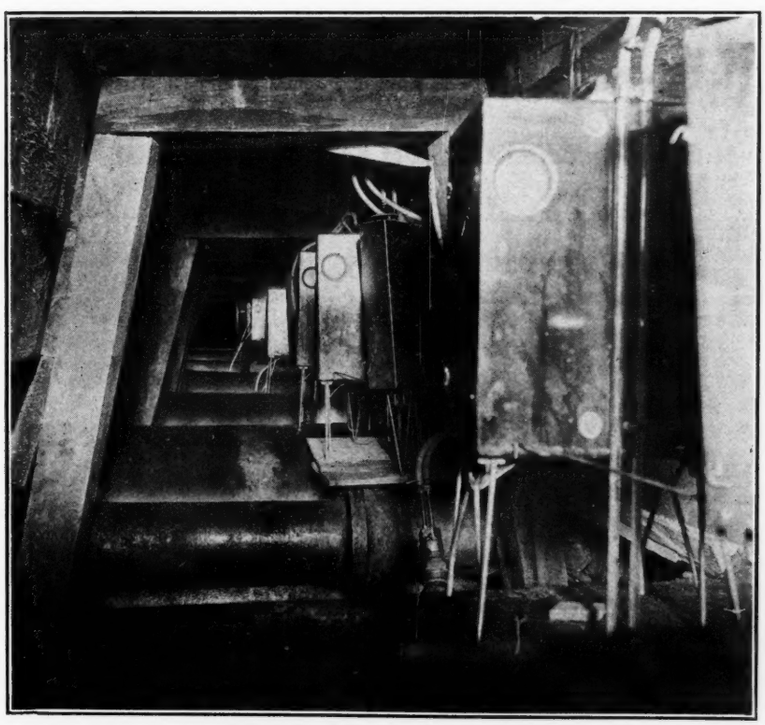
Youngstown, O.—It is stated that $125,000 bonds for filtration plant have been issued.

Contracts Awarded

Atlantic City, N. J.—It is stated that U. S. Cast Iron Pipe & Fdy. Co. has contract for c. i. pipe and specials for 1904.

Boston, Mass.—John F. Magee & Co., Taunton, was low bidder for building dam, at $95,245.

(Continued on page 32.)



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NEW YORK

Delta, Colo.—It is reported that O'Brien & Rhodes has contract for water works, at $64,500.

Flushing, N. Y.—It is stated that Thos. F. Tuchy & Co. has contract for new mains to connect Flushing, College Point and Whitestone standpipe reservoirs at $57,000.

Helena, Mont.—Congress Constr. Co., Chicago, Ill., has contract, at $579,000, for gravity system of water works. Will lay 24 miles of conduit outside, and 40 miles of mains inside city—about 6,800 feet of steel 24-inch pipe, and 4,000 tons of c. i. pipe, etc.

Long Island City, N. Y.—Thos. F. Tuchy & Co. was low bidder for mains in various streets, at $56,479.

New York, N. Y.—Norton & Dalton Contr. Co. was low bidder for furnishing material and laying water mains in several streets, at $41,545. Cunningham & Kearns Contr. Co. was low bidder for mains in other streets, at $108,502.

Rochester, Ind.—Stephens & Leiter has contract for water works.

Rockwell City, Ia.—It is stated that J. H. Miles Artesian Well Co. has contract for wells for city, at $5,000.

Seattle, Wash.—Jas. Markey has contract for mains in several streets, at $46,506.

Toronto, O.—Keystone Eng. Co., Pittsburg, Pa., has contract for pump at about $5,500.

Washington, D. C.—It is said that the U. S. Cast Iron Pipe & Fdy. Co. has contract for 800 tons of 8-inch c. i. pipe, at $20,560.

SEWERAGE

Alameda, Cal.—A sewer for Lincoln avenue has been discussed.

Alton, Ill.—The extension of the sewer work has been considered. City Engineer George Dickson.

Anderson, Ind.—Sewers and water works will be built in the spring.

Averne, N. J.—A sewer system to cost about $500,000 may be put in.

Asbury Park, N. J.—Neptune township may have a sewer system. D. E. Havens, Chairman Township Comm.

Auburn, N. Y.—Petition calls for a sewer in Havens avenue.

Baltimore, Md.—Engineers estimate the cost of a sewer system and disposal plant at $6,000,000.

Belleville, Ill.—Mayor Fred J. Kern wrote that plans were ready for an intercepting sewer, which is to empty into a septic tank. Cost of work, about $75,000.

Billings, Mont.—Estimated cost of proposed sewers placed at $17,500. City Engineer Smith.

Bloomington, Ind.—A sewer system has been under consideration.

Bogota, N. J.—An ordinance has been under consideration for a trunk sewer in northern part of town. Boro. Clerk H. P. Ross.

Butler, Mo.—Bids were to be asked for a sewer system. G. B. Hickman.

Chester, N. Y.—Cost of sewers in Locust avenue placed at $10,590.

Chicago, Ill.—Considering the construction of $500,000 worth of sewers and asphalt pavements.

Colorado Springs, Colo.—It is stated that about 6,000 feet of sewer extensions are to be built.

Colvill, Wash.—The construction of a $5,000 sewer system for business district has been under consideration.

Danville, Ill.—It was proposed to build 5,000 feet of 42-inch single-ring brick sewer, at a cost of $19,941. City Engineer W. H. Martin.

Des Moines, Ia.—It was proposed to build a $10,000 storm sewer system.

Detroit, Mich.—It was reported that $81,000 sewer bonds were to be sold.

E. Orange, N. J.—$25,000 sewer bonds have been sold.

Elmhurst, Cal.—Sewers will probably be constructed.

Everett, Wash.—It was stated that new bids were to be asked for sewers.

Fairview, Mich.—Estimated cost of trunk sewers placed at $46,000.

Fulton, Mo.—Bids will probably be asked January 1 for a $23,000 sewer system.

Gastown, N. Y.—It is stated that this place voted $22,000 for sewers.

Indianapolis, Ind.—The construction of an intercepting sewer in Brightwood has been under consideration. Board of Public Works.

Jersey City, N. J.—Plans have been made to improve several street by sewering, paving, etc.

La Crosse, Wis.—Plans have been completed for sewers on the North Side. City Engineer's Department.

Lake Charles, La.—A vote was to be taken on $125,000 for sewers. The Mayor.

Leicester, Mass.—A sewer for Paxton street has been under consideration.

Lewiston, Idaho.—Plans were adopted for the construction of the Normal Hill sewer system.

Lorain, O.—A storm sewer to cost $7,000 will be constructed.

Marshall, Tex.—The estimated cost of a sanitary sewer system, for which surveys have been made, is $150,000.

Mayfield, Cal.—A sewer system has been under discussion.

Milwaukee, Wis.—Considering the extension of the 30th street sewer. City Engineer Poetsch.

Moscow, Idaho.—It was stated that new bids were to be asked for proposed sewer system.

Muskegon, Mich.—Plans have been prepared for sewers, to cost $30,000. City Engineer.

New Orleans, La.—Bids are wanted February 2 for 66 miles of E to 27-inch sewers. Geo. G. Earl, Gen. Supt.

Niagara Falls, N. Y.—Petition calls for sewers in President street and in Buch avenue. City Engineer McCulloch.

(Continued on page 33.)

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Ogden, Utah.—Considering the construction of five miles of sewers. City Engineer A. F. Parker.

Pasadena, Cal.—Council has ordered sewers for various streets.

Peshtigo, Wis.—A $17,000 sewer system has been proposed. City Engineer H. A. McCallum.

Phoenix, R. I.—A resolution provided for $10,000 sewer at Riverpoint.

Port Huron, Mich.—Estimated cost of sewer in 32d street placed at $112,000.

Rochester, N. Y.—A resolution called for a sewer in Park avenue and Avenue B.

Rocky Ford, Colo.—A sewer system has been under consideration. City Clerk L. B. Elser.

St. Paul, Minn.—Bids will be asked for St. Anthony Park sewer. City Engineer Rundlett.

San Francisco, Cal.—Plans have been prepared for the reconstruction of a portion of the sewer system. City Clerk C. W. Fay.

San Marcos, Tex.—Estimated cost of sewer system placed at $35,000.

Seattle, Wash.—An ordinance provided for a sewer in 24th street.

Seneca, N. Y.—A sewer system has been under consideration.

Souix Falls, S. D.—It is stated that a $12,000 sewer will be built.

Springfield, Ill.—New bids will be asked, according to reports, for a sewer on Patton avenue.

Topeka, Kan.—The proposed sewer in the Second Ward will cost $80,000. City Engineer Jas. McCabe.

Vailsburg, N. J.—The estimated cost of a sewer system placed at $118,100. Engineer E. A. McMurray.

Wellesley, Mass.—A sewer system has been discussed.

West Orange, N. J.—A pumping station for a sewer system has been under consideration.

Woodside, W. Va.—A 24-inch sewer may be built in National Road.

Contracts Awarded

Cape Charles, W. Va.—Contract for sewers awarded Martin McNamara & Co., Washington, D. C., at $7,000.

Centralia, Ill.—Iowa Engr. Co., Clinton, Ill., informed us that contract was let Engel & Carpenter, W. Pullman, Chicago, Ill., for sewers, at $30 for manholes, $75 for flush tanks, 45 cts. per ft. for 8-inch, 84 cts. for 10-inch, $1.17 for 12-in., $1.17 for 15-in., and $1.20 for 18-inch pipe. There were 75 manholes, 21 tanks, 23,920 ft. of 8-in., and 10,165 ft. of 10-in. pipe.

E. Hartford, Conn.—Olmstead & Moore have contract for 1,200 feet of 8-inch sewer at $2,000.

E. Syracuse, N. Y.—M. O'Herron & Co., Pittsburg, has contract for sewers in Sect. 1. Contract for Sect. 2 let DeNalls & Klingberg.

Helena, Mont.—Jas. Kennedy, Fargo, N. D., has contract for sewer system at $12,500.

Kansas City, Mo.—Contract for lateral sewers in Dist. 218 awarded W. C. Mullins at $204,812.

Lincoln, Ill.—Googan & Mitchell has contract for sewers in three streets, at $4,893.

National Park, N. J.—Harry A. Miller, Wilmington, Del., was low bidder for sewer system, at $5,388.

New Brunswick, N. J.—Moran & Sutton has contract for sewer work in various streets.

Oakland, Cal.—E. B. & A. L. Stone Co. was low bidder for outlet sewer, at $136,511.

Pine Bluff, Ark.—Contract awarded for 9 miles of sewers to Theodore Hartman, Little Rock.

Port Huron, Mich.—J. A. Mercier, Detroit, has contract for tunnel sewer, at $75,000.

Riverdale, O.—John Hill was low bidder for sewers, at $2,705.

St. Paul, Minn.—Dickson & Moore has contract for sewers in various streets, at $23,898.

Schenectady, N. Y.—Geo. W. Van Vranken has contract for 24-inch iron pipe sewer, at $9.457. Jas. J. Quick has contract for 8-inch sewer in Furman street.

Seattle, Wash.—T. L. Peterson was low bidder for Brooklyn avenue sewer system, at $58,051.

So. Bend, Ind.—H. DeVos & Co. has contract for pipe sewers in two streets, at $2,168. Peter Suzio received contract for pipe sewer in Hill street, at $6,167.

Springfield, Ill.—Welch & Patterson has contract for sewer in Lawrence avenue, at 78 cts. for 18-inch sewer, 38 cts. per ft. for inlet pipe, and $23 for manholes.

Syracuse, N. Y.—C. T. Hookway has contract for 10-inch pipe sewer in several streets, at $8,933.

Wilmington, N. C.—Roger Moore has contract for 1,600 ft. of 24-in. surface drain, at $3,750. W. E. Glenn has received contract for sewers, at $3,250.

MISCELLANEOUS

Arverne, N. Y.—Estimated cost of a sewer system and disposal plant placed at $500,000.

Atlantic City, N. J.—Contract to destroy the city garbage let Atlantic Farms Co., for ten years, at $20,300 for the first year and $1,000 additional each year following. Council recently visited Philadelphia to inspect a garbage incinerator. The Council is considering a public park.

Atlantic City, N. J.—It is stated that the contract with the Philadelphia concern to build a $200,000 garbage crematory has been vetoed by Mayor Stoy.

Augusta, Me.—The purchase of a site for a public park being agitated.

(Continued on page 34.)

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Baltimore, Md.—A system of sewers and filtration plant recommended by City Engineer Fendall, at $6,000,000.

Barberton, O.—It is said that $75,000 bonds for water works and fire department.

Belleville, Ill.—Mayor Fred J. Kern wrote that plans were ready for an intercepting sewer and septic tank. Cost of all placed at $75,000.

Braddock, Pa.—The Austin Western Co., Ltd., received a contract for a two-horse street sweeping machine.

Bridgeport, Conn.—Press reports states that the Health Officer advises that the city collect the ashes.

Bridgeport, Conn.—A new hook and ladder truck may be purchased for the fire department.

Carlisle, Ky.—$5,000 were voted for a fire engine.

Charleston, S. C.—The Public Utilities Co., 15 William street, New York City, received a contract for a 20-ton crematory, brick building and chimney, at $8,077.

Chattanooga, Tenn.—The Board of Public Works were to ask bids for street cleaning.

Chester, O.—It was stated that a fire department would be formed.

Chester, Pa.—Council provided for a combination chemical engine.

Cincinnati, O.—A new truck and fire engine are needed. Fire Comrs.

Claremont, Cal.—There has been talk of forming a fire department, according to press reports.

Cleveland, O.—It is said that plans are to be drawn for a municipal garbage crematory and that City Solicitor Baker is to draw the specifications.

Coatesville, Pa.—Chief Steinwachs writes us that the Washington Fire Company will build a new station in the near future.

Columbus, O.—Estimated cost of a sewage disposal plant placed at $1,200,000. City Engineer Griggs.

Danville, Ill.—A committee has been appointed to consider methods of disposing of garbage. Health Commissioner.

Davenport, Ia.—May have a garbage crematory.

Fort Wayne, Ind.—Frank Draker has contract for collecting garbage.

Harrisburg, Pa.—There is talk of extending Capitol Park.

Indianapolis, Ind.—Specifications for street cleaning prepared for 1904. City Engineer Jeup.

Jackson, Miss.—Chief of Fire Department, J. Hunter Taylor, wrote that bids are wanted January 6 for 2,000 feet of hose and two hose wagons. Address Y. D. Lott, City Clerk.

Jacksonville, Fla.—A press report stated that a company might be formed for disposing of garbage and refuse. Address Judge A. O. Wright.

Knoxville Tenn.—Contract for fire hall let Galyon & Borches at $23,057.

Lewisburg, O.—Bonds in the sum of $18,000 were to have been issued for fire engines, etc. City Clerk J. H. Dominy.

Macon, Ga.—It was reported that plans for a crematory were being considered.

Manchester, Mass.—G. M. Gest, New York, has contract for complete conduit system for the Manchester Electric Co.

Manhasset, N. Y.—A volunteer fire company has been organized.

Massillon, O.—A police alarm system was to be installed. J. F. Shepley, Sec'y Board of Safety.

Minneapolis, Minn.—Lowry Hill will be developed into a park. Park Bd.

Nashville, Tenn.—The Board of Public Works will probably put in a $5,000 garbage crematory. Two city parks will be constructed.

New York, N. Y.—William Bradley was low bidder for removing snow and ice, at 16 cents per cubic yard.

New York, N. Y.—Comr. of Parks Wilcox estimated the cost of a system of parks on Staten Island at $2,000,000.

Oakland, Cal.—New bids will probably be asked for disposal of garbage and refuse.

Orange, N. J.—The garbage crematory may be enlarged according to reports.

Oswego, N. Y.—A report stated that a plant for the consumption of refuse might be put in.

Ottumwa, Ia.—A chemical engine was to be purchased.

Philadelphia, Pa.—John D. Pessano & Co. offers to erect a $1,500,000 garbage crematory if a 30-year contract be granted him.

Philadelphia, Pa.—New bids for street cleaning are to be asked, according to press reports, inasmuch as the old bids were much too high. Director Costello, Dept. of Public Works.

Pittsburg, Pa.—U. S. Reduction Co., Cleveland, may erect a reduction plant here.

Rochester, N. Y.—The Park Board wanted $150,000 for improvements.

Rockville, Conn.—Committee is investigating question of filtration beds for sewage disposal.

Springfield, O.—It is stated that a bond issue for sewage disposal will probably take place.

St. Joseph, Mo.—The City Garbage Co., organized. W. F. Cox, Manager, Ballinger building.

St. Louis, Mo.—$20,000 appropriated for the erection of an engine house. The City Garbage commission recommended two incinerators for the city.

Sandusky, O.—Discussing the question of a garbage reduction plant.

Southbridge, Mass.—Five-year contract for collecting garbage was asked by E. W. McCrillis, Charlestown, Mass.

Spokane, Wash.—City will be given a new park by private parties.

Springfield, O.—A sewage disposal plant has been considered. City Engineer, Sieverling.

Tampa, Fla.—It was stated that $15,700 bonds for a garbage crematory were to be issued.

(Concluded on page 35.)

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Tampa, Fla.—Decarie Mfg. Co., Minneapolis, Minn., has contract for garbage crematory to cost $17,500. City Clerk Henderson.

Troy, N. Y.—Contracts for two fire engines awarded the Nott Fire Engine Co., Minneapolis, Minn.

Utica, N. Y.—The question of sewage disposal has been discussed.

Wilmington, Del.—A new garbage plant to be erected by private parties has been under consideration by the Council Crematory Committee, of which George Willis is chairman.

Woodbury, Conn.—A chemical engine was to have been purchased. Town Clerk.

Woodlawn, Ala.—Equipment was to have been purchased for the reorganized fire department.

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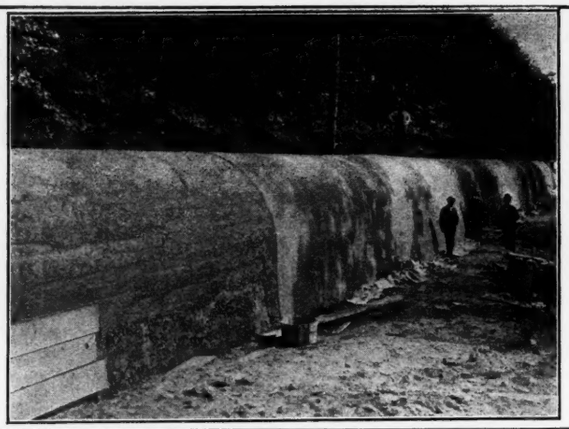

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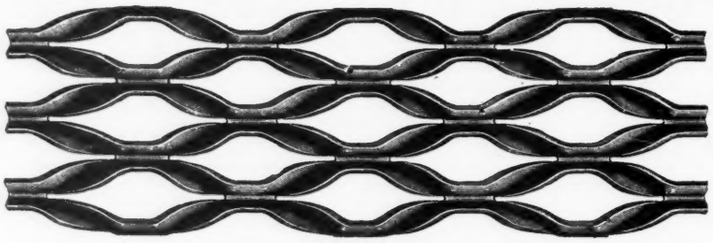

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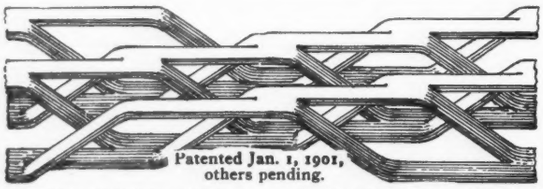

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